THE INCREDIBLE POMEGRANATE

PLANT & FRUIT

By

Richard Ashton

With

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Richard W. Ashton  
Barbara L. Baer  
David E. Silverstein
The Incredible Pomegranate

INTRODUCTION

Sitting down at a table for a holiday dinner, someone asks, “What is it that makes the salad so sweet and nutty?” Well, the answer is that salads can be made ‘sweet and nutty’ by adding pomegranate arils. Arils are the sack that holds the seed and the juice. With the many varieties available now, you may find seeds for your salad or other dishes that are small and explode with lots of sweet juice.

At the breakfast table, someone asks “What is this great juice?” The answer may be pomegranate juice. Many people are discovering the juice for the first time and cannot get enough of it. For the first time in the United States, pomegranate juice is widely available. What makes pomegranate juice an even better choice for your morning drink are the health benefits associated with it.

If it is pomegranate juice or pomegranate arils that make your meal better, you will find there are many other tasty and healthful products made from pomegranates. There is pomegranate jelly, pomegranate syrup – great on pancakes— and grenadine that makes a colorful and flavorful addition to drinks. In the Middle East, cooks use concentrated pomegranate syrup from some of the sour varieties in their meat dishes and poultry dishes, to give both a very good, unusual flavor.

If the thought of rosy juice and tasty dishes are making you hungry or thirsty there are a great many other surprises about pomegranates to be discovered. Did you know that pomegranates come in many flavors, from very nicely sweet to sweet-tart to sour and many unexpected tastes between? Pomegranates do not all taste the same—that sweet-tart flavor of the “Wonderful” variety that you get in the grocery store is not the only one. Many pomegranates only taste sweet and have no tartness about them. In Spain, the best selling variety “Mollar,” is a sweet tasting variety that has no tartness. This is true as well of the most popular varieties growing in India, the world’s second largest pomegranate producer. Of course, taste is a personal thing and many people like the sweet-tart flavor but you might
experiment and discover that like the Spanish or the Indian, you become an aficionado of the strictly sweet flavor.

Another surprise — the pomegranate’s seed hardness varies a lot, from hard to nearly unnoticeable. There are varieties of pomegranates that have only a seed remnant like a seedless grape and many varieties that are called soft-seeded. If you like drinking the juice, then the seed hardness will not make much difference to you because you’ll be squeezing the fruit. Here the normal, harder-seeded varieties may be what you want.

If you have ever seen pomegranates in bloom you know how lovely the flowers look dangling like little lamps on the limbs. There are ornamental varieties of pomegranates with fancy blooms that are grown only for their flowers and background color. Another plus: pomegranate flowers start early and continue to blossom on the tree a long time, so you’ll have color into autumn.

In many parts of the world, the pomegranate is considered a prized fruit essential to local cuisine. In the ancient world pomegranates were just as important as a sacred object, both fruit and tree a symbol of life giving forces, of fertility, even of immortality. Traditional folk medicine had long recognized the fruit’s many uses for prevention of illness and healing, while in the west, we are only now discovering the tremendous health benefits. Pomegranates are high in anti-oxidants and may be used for enhancing cardiac health and as an anti-viral agent, among other wonders the fruit promises.

If you are going to grow one or more pomegranates, you are fortunate to have a choice that fits your needs among the 150 varieties available in the United States. World-wide, there are more than 1000 known varieties, but we are fortunate to have as many as we do today. How will you choose your variety? You will want to think of climate and soils and other questions that we will try to answer in the following pages.

This book offers you all the information you’ll need to select and grow pomegranates, as well as the adventure of becoming acquainted with the fruit that has inspired many adventures and stories we hope you will enjoy.
CHAPTER I: MEET THE POMEGRANATE

Richard Ashton

To meet the pomegranate, we need to go far back in history, back before the people we consider ‘modern’ started the long and fruitful story of horticulture.

The pomegranate is native to Central Asia and Persia where its history starts. It was first discovered and exploited as a wild plant; only later people who lived in the hills and valleys of the region learned to domesticate the fruit. From its centers of origin, the pomegranate spread like a pebble thrown into a still pond; the ripples of its culture spread in all directions within sub-tropical and mild temperate zones. The spread was somewhat slow at first: 5000 years ago people were few and far between.

The first record of pomegranate cultivation in about 2200 B.C comes to us from the ancient civilization of Sumer, located in the lower Tigris and Euphrates valley, approximately the area of present day Basra, Iraq. It is believed that the pomegranate was brought into the area by people who were migrating from the Zagros Mountains—on the present day Iran and Iraq border. From there the pomegranate spread east to Asia Minor in about 1300 B.C. when the Phoenicians started to cultivate it. The Phoenicians were great traders who sent many ships to ports in the Mediterranean Basin. By 1000 B.C., pomegranates were growing in Carthage and Egypt.

Ancient traders in Central Asia and the Middle East referred to the pomegranate as the “fruit of paradise.” Arabian caravans carried the fruit with other trade goods and spices, as well as the water and food they transported to provision the travelers. The pomegranate’s leathery-skin provided a long storage life and replacement for water. Containing up to 80 percent water, the fruit supplied liquid and minerals – sodium, potassium, calcium, iron and phosphorus that travelers lost to sweat in the hot deserts they crossed. After the caravans
passed, you would generally find pomegranates growing in the settlements the traders had visited.

Pomegranate cultivation spread to India from Afghanistan but the earliest date of cultivation is not known. Afghanistan is part of the original native area of the pomegranate. We know that there are wild pomegranates in the northwestern mountainous area of India at present. Pomegranates are prized and especially used at festive occasions along with jujubes and grapes in India.

To the East, the pomegranate spread to Samarkhand and from there to China about 150 B.C. where yellow skinned types were introduced. Even today, the Chinese think that a pomegranate has to have a yellow skin color to be good. The Chinese consider the pomegranate one of the three blessed fruit (the others are the citron and peach.) The numerous seeds symbolized many male offspring dispersed around the world earning fame, fortune and glory.

Back in the Mediterranean Basin, we have reports that pomegranates were grown in the gardens of Alcinous (probably in Sicily) by Homer in *The Odyssey*. But the most celebrated pomegranates in the Mediterranean Basin grew in ancient Carthage in North Africa. There we have reports of the largest, sweetest and nearly seedless pomegranates much prized by Romans. In fact the first scientific name for the pomegranate was *Malum punicum*, meaning Apple of Carthage.

Linnaeus later named the pomegranate *Punica granatum*, its current scientific name. As you can see the name still retains a derivate of the word *Punic* referring to Carthage.

The Greek legend of Persephone is one of our most evocative myths about the pomegranate. Persephone was abducted by the Lord of the Dead. Her mother Ceres roamed the earth, turning all to winter and death in her grief. Finally there was a compromise between Zeus and Hades, Lord of the Dead. If Persephone had not eaten anything in her captivity, she would be returned to her mother. But she had eaten six pomegranate seeds secretly in the underworld. She was permitted to return to her mother, Ceres, to bring Spring and life back to earth, but because she had tasted the fruit in Hades, she was condemned to return to the realm of darkness for 1/3 part of the year, causing winter on earth, beginning our alternation of live and death in nature. The myth of her eternal return and the changing seasons of the year were of enormous significance to the Greeks who worshipped Persephone and Ceres, in rituals every spring.
Egypt was one of the early recipients of the pomegranate in the ancient world, and like the ancient Greeks, developed fabulous stories around the fruit. Pomegranates were found in the tomb of King Tut, evidence that the Egyptians believed the pomegranate would help them into the afterlife. About the same time, the Hebrew slaves in Egypt became acquainted with the pomegranate. It would be one of the fruits of the Promised Land. The pomegranate is praised in the “Song of Solomon” where all things of beauty are compared with it. King Solomon had pomegranates engraved into the columns of his temple and woven into the robe of the high priests. Jewish custom considers the pomegranate very important. Tradition has it that the pomegranate has 613 seeds to represent the 613 commandments of the Torah. In actual fact, a pomegranate can have as many as 1300 seed but most are less.

In the sacred writings of Islam, the pomegranate was praised as well. In the Qu’ur’an, the pomegranate is called the “Fruit of Paradise.” Ancient Arab traders called it thus and in Arabic folklore and poetry, the pomegranate was the symbol for the “Fluid of Life”—the mother’s breast.

The Spanish had early on acquired the pomegranate and took it to the new world with them. Fruit and trees traveled with them, to Mexico, and in the 1500’s to California, the 1700’s to Spanish Florida. We can say that the pomegranate was already in parts of the United States before those parts were made part of this country. It is also believed that it came to Florida with a shipment of oranges and found its way in the southern United States from there.

In the early 1900’s, the USDA Division of Seed and Plant Introduction station listed over 100 varieties of pomegranates, many of them seedlings of the varieties the Spanish had introduced earlier. The USDA held pomegranate germplasm at the Plant Introduction Station at Chico, California, in the early years.

The variety that most see in the nurseries nowadays is called “Wonderful” and was found in a batch of cuttings that a Mr. Bearrs of Porterville, California, got from Florida in 1896. One of the cuttings proved especially good and was named “Wonderful.”

DESCRIPTION

The pomegranate is a large shrub, measuring less than 15 feet in cultivation although it can reach 30 feet in the wild. More frequently in the wild, the
pomegranate is a shrub. Under cultivation, it is still best grown as a shrub but can be pruned into a single-trunk tree. The pomegranate lives to a very old age–there are documents attesting to trees that lived 300 years. Older trees tend to lose their vigor and production declines after about 25 years.

A tree is usually kept to 3-6 trunks for fruit production. They tend to sucker around the base. These need to be removed, though they can be used as cuttings for propagation if you choose not to discard them. The trunks are more or less round, erect, with alternate open branches somewhat prickly at the end. The ageing bark shows cracks and takes on a grayish color and may appear knotted and twisted. The bark had long been used in traditional medicine, and nutraceutical companies now are exploiting bark and rind for the alkaloids they contain. The shrub itself varies in appearance from drooping to erect depending on variety and growing conditions, though the majority are erect. The buds on the secondary growth (the growth from the primary trunks) are lateral and in the axils of the leaves. The terminal buds at the very tip sometimes produce a thorn; other times they grow into a flower or cluster of flowers, or simply fall off. Since the plant does not possess real terminal buds, growth has to be from the lateral buds.

The shrubs start to bear after about 3 years for seedlings and about 2 years for plants grown from cuttings. The plants reach maturity at 8-10 years.

The pomegranate belongs to the Myrtle family. There are 2 genera, *Punica socotria G. Levin*, which occurs as a single variety located on an isolated island, and the common pomegranate, *Punica granatum L.*, with many varieties, the subject of this book.

**THE LEAVES** measure about ¾ - 3.5 inches in length and 4/10th – 1.2 inches in width. They have short leaf stems (petioles.) There are three leaves per group arranged at 110 -130 degrees; rarely there are four leaves per group. The young reddish leaves turn bright green when they mature, the top of the leaf darker green than the bottom, while the leaf stem remains reddish in color.

**THE FLOWERS** appear as singles or in small clusters, generally of 2-6 flowers occasionally at the end of the branch but sometimes on the auxiliary buds. Out of 25-30 buds, usually 3-5 flowers develop. They may appear on last season’s growth with the same arrangement and occasionally only on the last season’s growth, but most are borne on the current year’s growth. The long flowering period of the shrub results in a long harvesting season though the last flowers that bear fruit will have fruit that will be small and not as good in quality. The pomegranate
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is self-fruitful so the flowers are both male and female. The flowers have a pear shaped body, concave and fleshy, with a bell-shaped calyx (the crown.) There are 5-8 petals that are wrinkled, alternating with segments between the petals (sepals), the petals being longer. There are 5-8 segments (sepals) between the petals and they form a continuous fleshy, red scalloped form. The male parts (stamens) around the female part (pistil) are inserted in the calyx walls and frequently amount to more than 250 per flower. The male parts (stamen) are about $4/10$ of an inch long, have a reddish stem, yellowish anthers (pollen bearing part.) The remains of the stamen do not disappear but remain inserted into the calyx which crowns the ripe fruit. There are about 4-15 female cavities (carpels.) They are superimposed into whorls because of the development of the fruit body. They form a simple ovary of two layers (rarely one and very rarely three) with 5-9 parts (locules) on top and 2-5 locules on the bottom. The flowers are orange-red or intense red in the majority of the cultivated fruiting types. The ornamental varieties have flowers that range from white to red with many shades in between. The fruiting varieties have single flowers but the ornamental varieties are usually double.

THE FRUIT is a fleshy inferior berry, with a thick skin enclosing the edible parts, with cavities (locules) of 4-15, separated by membranous partitions (carpellar membranes) or as some would say, rag. The interior is filled with many fleshy seeds prismatic in shape. The numerous seeds are each surrounded by juicy, sub-acid pulp (arils) which is the edible part. There are 1200-1300 seeds in the large-sized fruit with less in the smaller fruit. The background color of the fruit is usually greenish yellow or brown with reddish areas which may occupy the whole surface of the fruit. The overall fruit skin color can be yellow, red, pink, dark purple and many shades in between. The most common skin color in the United States is red. The reddish skin color is the most attractive to the American consumer.

There is not necessarily any correlation between the exterior and the quality of the fruit inside. The fruit generally range in size from 2 – 6 inches in width. They are spherical somewhat flattened, also pear shaped, with a calyx (crown) that stays with the fruit. The calyx may be 1.5-2.5 inches long but it varies with varieties. The varieties with a closed calyx are more disease and pest resistant.

RIPENING occurs about six months after flowering in normal pomegranate zones with average varieties, the early varieties taking somewhat less time to ripen. The best fruits are obtained in those areas where the period of development occurs
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during the time of high temperatures. The fruit is non-climacteric (will not ripen
off the shrub) and should be picked after it has reached maturity. In storage it will
dry out a little, causing the sugars to concentrate, which makes it appear sweeter.
Most commercial orchards pick the fruit just before complete maturity as the fruit
will tend to crack if left too long.
CHAPTER II: A POMEGRANATE QUEST

Barbara L. Baer

In the summer of 2001, while driving home on back roads in northern California, I caught some Russian words on BBC/The World. The segment was being broadcast from rural Turkmenistan, near Iran’s northern border. “The birthplace of the pomegranate was here in the Kopet Dag Mountains of Central Asia” the speaker said. “And here is the last place on Earth where wild pomegranates grow.”

Sonorous language rose over the sounds of rustling leaves and cries of birds. I heard the English interviewer exclaim over sweet wild grapes, pungent arugula, and acres of wild pomegranates that stretched their canopies along the riverbed. A Russian-born botanist, Dr. Gregory Levin, the lead researcher at an agricultural research station called Garrygala, said that conditions were going from bad to worse. The station’s sprawling collections of pomegranates, persimmons, pears, apricots, apples, figs, and native grapes were dying from drought, and there were no pumps to bring water up from the Sumbar River. “We often carry water cans to each tree,” Levin said. “In the pomegranate forests some miles above our station, sheep and cattle are grazing on wild grasses and destroying the young wild trees.”

I felt my throat constrict with thirst as I imagined Levin tending his stricken orchards. In my mind’s eye, he had a Trotsky beard and round glinting glasses. I supposed that he knew personally all the 1,117 living pomegranate plants he had collected from twenty-seven countries on four continents.

“Garrygala” the American voice continued, “had been in dire need of financial help since the breakup of the Soviet Union in 1991 when Moscow stopped financing science in its former republics. From the Arctic seas to the Pacific Ocean, Soviet scientists lost labs, facilities, and salaries. To survive, many put their services up for sale. The need to re-employ nuclear specialists was obvious to Western governments, but a pomegranate botanist less so.”
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Levin confessed that he was losing heart and ready to retire, but he lacked a successor and feared the collection would be lost. The orchards were overgrown with weeds, the Turkmenistan government wasn’t protecting the forests or paying worker’s salaries, and the facility was quickly becoming a ruin. Only help from the outside world, he said, could save Garrygala.

After the program ended, the fruit still glowed like rubies in my mind. I felt that more than chance had carried this man’s voice from Turkmenistan to my car radio where he had delivered a personal plea and an invitation to me from the last wild pomegranates.

I tasted a pomegranate early in life and never forgot the mysterious, hard, red globe with its infinite, glistening red jewels. The first time my mother showed me how to get to the juicy sweetness within, she wrapped me in a towel and gave me a spoon to explore it as only a child can—with fingers, and seeds all over.

She also introduced me to the Greek myth of Persephone. I saw myself as the dark-haired girl who wandered too far, and my mother was the powerful Demeter who would never give up searching for me. My real, beloved mother with her shiny black hair and sun-browned arms turned every apricot, peach, and quince she grew into jams and chutneys. The house smelled of sugar, vinegar, ginger, and cloves transforming fruit from our orchard.

Pomegranates, each one an ovary packed with seeds, are the essence of femaleness, fecundity, and beauty. Some biblical scholars argue that Eve pulled down the suggestive pomegranate in the Garden of Eden, and in Islam, it is the “fruit of paradise.” Pomegranates connect death and resurrection in the spring as Persephone emerges from the Underworld with the first green shoots of spring.

In spring, pomegranate trees begin to leaf out. Soon, scarlet or peach or white blossoms open on branch tips. After bees pollinate the blossoms, flesh-wrapped seeds begin to grow around each original flower. As the abundant seeds expand within tough outer skin, the six-petaled calyx continues to hang down, revealing the fruit’s plump sexual parts, as if the seduction were never over. In late fall, when most other fruit trees stand with bare branches, many varieties of pomegranates blossom again and again, their amphora-shaped petals swishing on new wood like Persephone’s skirts.

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A month after the radio program, September 11 happened, and obtaining a visa to Central Asia became exceedingly difficult. I tried to get in touch with Dr. Levin at Garrygala, but there was no Internet connection at the research station. I relied on Dr. Muhabbat Turdieva, a plant geneticist at Tashkent University, to keep me apprised of the situation in Turkmenistan while I waited for my visa.

Dr. Turdieva gave me a little of Dr. Levin’s history. He had arrived in 1961 at the Garrygala Agricultural Station founded by the greatest Russian botanist, Nikolai Vavilov. Vavilov had chosen the location three decades earlier, believing that the subtropical valley tucked into high mountains was a crucible for the pomegranate and other fruit and nut-bearing plants. The valley was a little Eden, protected against cold winters and hot desert summers. Using Garrygala as his base, Levin had spent most of his adult life trekking around Central Asia and the Caucasus in search of pomegranates, writing more than 300 scientific papers on the topic, and tending the orchards at the station.

By poring over everything from Levin’s papers to articles in Agricultural Research, I absorbed a trove of information and became more deeply concerned that this little paradise on earth shouldn’t be lost. Dr. Turdieva took the lead and I helped her produce a fundraising brochure for the research station.

Early in 2002, I sent $500 to Muhabbat to print the brochure, “Ruby Treasure: Securing the Wealth of Pomegranates in Central Asia.” We hoped it might reach donors who would help finance the rescue of Turkmenistan’s wild pomegranates and the station’s irreplaceable collection. The brochure felt like my own passport to Garrygala—but still I waited for my visa to arrive.

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In Turkmenistan, where Levin had collected his 1,117 different rare and unusual accessions, the news was not good: both wild forests and trees in Garrygala’s collection—“the unique wild and cultivated patrimony” as Levin had written in one scientific paper—were dying. The irony was that in California, one variety, the Wonderful, was being pumped up and juiced out to become a trendy fruit, while the wild pomegranate germplasm was withering away.

When my tourist visa finally arrived, I was granted a week in Turkmenistan with a tour group leaving in October of 2002. I had hoped to travel alone, but a tour proved the only way to get in. Muhabbat assured me we’d have time to go to Garrygala.
Out of the desert blackness our bus approached Ashgabat, Turkmenistan’s capitol. At the highest point, visible for miles around, the golden statue of Turkmenbashi rotated 220 feet in the air. A former Communist chief, Turkmenbashi had taken power as the Soviet Union collapsed in 1991. In 1999, a rubber-stamp legislature elected him president for life, and in the decade since, he stayed busy dedicating the resources of his impoverished country to a Stalinesque personality cult, renaming cities, streets, mosques, factories, airports, and even days of the week after himself.

The next morning I looked out the window of my Ashgabat hotel room through a hazy sky to the Kopet Dag range, which runs southeast along Turkmenistan’s border with Iran and peters out near Afghanistan. The tan ridges, dangerous old crags on a major tectonic fault line, appeared deceptively soft through smog. Six stories below, hundreds of pigeons were using an Olympic-sized pool for a bath.

That Dr. Turdieva still hadn’t registered worried me. I waited in the lobby, remembering our last e-mails. She’d written of difficulties obtaining a visa to travel from Uzbekistan to meet me in Turkmenistan.

Two modestly dressed people stepped through the revolving doors. One was a stocky woman with flat Central Asian features, dressed severely in a Soviet-era black suit. Beside her stood a slender man in his fifties who looked like a Chinese sage.

“Miss Barbara?” asked the woman. “I am Dr. Lena, a native plant specialist at Ashgabat University. Thank you for your interest in us. Dr. G.M. Levin has recently moved to Israel. I would like to present the director of Garrygala Experimental Station, Dr. Makmud Isar.”

My heart fell. She then delivered the words I hoped I wasn’t hearing. “Because Garrygala is located close to the border with Iran, for security reasons the authorities have decided it is too dangerous for you to travel there.”

She avoided my eyes. “In three days, I’ll be crossing into Iran myself,” I said, realizing that my dream of visiting Garrygala was vanishing before my eyes.

“Dr. Muhabbat Turdieva also failed to get a visa from Tashkent,” Lena said, handing me two heavy books praising the environmental work of Turkmenbashi.
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“We are so sorry for the trouble,” said Dr. Isar, presenting a bag of pomegranates nestled like Christmas balls in tissue. They were garnet, cream-colored, and hot-pink tokens to make up for not seeing them in their natural glory.

Dr. Isar took me on a city tour and then invited me to his home where his daughters prepared me a traditional Turkmen meal. As the lamb sizzled, Dr. Isar and his sons began to roll out pomegranates on a flowered quilt. They were in colors I’d never seen or imagined pomegranates could be, yellow pink, peach, crimson, maroon, and purple—no two alike. The tastes were so different as well: some had an acidic bite, others were boldly sweet. A big pink one tasted like honey. As I swallowed, my eyes filled with tears. This was no Garrygala I’d reached, nor was this Dr. Gregory Levin whose voice I had followed so far. All I had were the fruit of the trees I’d been dreaming of.

“My pomegranate wine,” Isar said, uncorking two murky bottles. “Good for digestion.” The wine tasted medicinal yet sweet, like Genepi, the artemesia-based liqueur from the Alps and Pyrénées.

After dinner, we lugged more pomegranates into a taxi and drove back to Ashgabat’s center. The desert night was warm. We wandered from one fountain to another, sometimes talking, sometimes silent, reluctant to say good night. Arriving finally at the hotel, I thanked him. “For everything, the pomegranates especially,” I said Sadly.

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Nearly two years passed between my original search for Gregory Levin and working on an article for Orion magazine about the lost pomegranate treasures of Turkmenistan. The Orion editors urged me to find out what had happened to Dr. Levin. The article needed that conclusion even if my own quest had failed and I’d given up. My luck turned when I found Shir Kamhi in the Agriculture Section of the Israeli Embassy in Washington. Ms Kamhi treated my request to find a pomegranate specialist, Dr. Gregory Levin, as if it were a family matter.

The morning Gregory Levin’s name popped up on e-mail, I was too moved to open it immediately. “Dear Madam Barbara I thank you for letter,” wrote Dr. Levin, who used a Web-based translation software to turn Russian into English. “It was very pleasant to me to found out that in U.S.A. there are still people whom pomegranate interests.”
Dr. Levin had not known I’d tried to visit him. He’d left Garrygala as the station was collapsing under his eyes. Watching the collection he’d tended for decades fall into the wrong hands had been too painful to watch. He wrote that he’d brought cuttings to Israel and sent many varieties to the Wolfskill Experimental Orchards, part of the USDA National Clonal Germplasm Repositories at the University of California at Davis.

If I couldn’t meet Dr. Levin, nor visit the subtropical paradise where he’d worked, I could easily visit U.C. Davis, two hours away from my Sonoma County home.

I was greeted by two enthusiastic young men, the greenhouse manager Jeff Moersfelder and his technical assistant, Joe Wehrheim. They showed me a section of trees marked PROVENANCE TURKMENISTAN. It was as if I knew them. Parfyankas were big and red-rose, with soft seeds. Azadis were peach-colored and delicate as a flower. Girkanski’s were dark, almost purple, with a wine-rich flavor. Moersfelder probed the arils to show me seeds, some large and soft, others hard and small.

Hanging alongside mature fruit, color-coordinated flowers glowed against the blue sky. The extended flowering time, Moersfelder explained, happened only in experimental orchards like Wolfskill, or Garrygala, where numerous varieties grew together in what he called “a tree museum.” In a commercial orchard such as Paramount Farms, timing is not left to nature. Wonderful pomegranate trees bloom and produce fruit on schedule for workers to pick.

I asked where, exactly, had the trees come from. “Central Asia,” Moersfelder answered. “I wish we knew more about their origin and botanical history.”

“They must have come from Gregory Levin,” I said. “He created the largest collection of pomegranates in the world in Turkmenistan.”

I told them how to reach Dr. Levin by e-mail in Israel. Days later, Gregory Levin wrote that the UC Davis botanists had contacted him. Indeed, he knew their varieties well. “Of course, he wrote. “I personally sent them pomegranates.”

The recognition and interest pleased Dr. Levin but he still regretted that his life’s work, contained in a botanical monograph on pomegranates, wouldn’t reach a larger audience. He wished that his “work done has not gone to waste and was accessible to science. This is our common cause.”
I suggested to him that his adventures as a pomegranate explorer and his descriptions of forays in the Transcaucasus and Central Asia could make a fine book for my small publishing house, Floreant Press. I wouldn’t be able to publish his botanical monograph but perhaps his life story would inspire someone to do so. He responded immediately: “Forty years I am engaged as hunter behind plants, gathering and creating collection. I am calmed by this news and hope that work is not vain, but also sometime will be read. For this, my gratitude does not have borders.”

Dr. Gregory Levin’s *Pomegranate Roads: A Soviet Botanist’s Exile from Eden*, translated from Russian by Margaret Hopstein, came out in November, 2006. I’ve received orders from Malta to Israel, from India to parts of the United States I never imagined had seen a pomegranate tree. The varieties of rare and unusual pomegranates from Dr. Levin’s Turkmenistan collection growing in the USDA orchards at Davis are traveling further. Richard Ashton is planting them in Texas. They will be growing in the experimental orchards of Texas A & M University, Gardeners from California to Georgia are planting the Central Asian varieties you will learn how you can do the same as you read on in *The Incredible Pomegranate*.

My journey to the heart of the pomegranate world hasn’t ended with the publication of Dr. Levin’s book, or to put it another way, pomegranates aren’t finished with me yet. In October 2006, I bought a ticket to fly to Adana, Turkey, to the first world-wide pomegranate symposium where I’d hoped to meet Dr. Levin. Some months before I was to leave, he wrote that his health would not permit him to travel. I was deeply disappointed: once again, so near and yet so far. However, at the symposium, through circumstances beyond my control, I ended up reading Dr. Levin’s keynote address before an audience of punicologists. So many faces lit up when I described the author’s situation, his new life in Israel and his continued work. It was as if Gregory Levin was making a lightning appearance. And best of all, I could promise that *Pomegranate*, Dr. Levin’s botanical monograph, would be published by 2007 and available world-wide via the Internet for generations of punicologists to follow this great botanist’s devotion to our beloved *Punica granatum*. 
The Incredible Pomegranate
The Incredible Pomegranate

CHAPTER III: GROWING POMEGRANATES

Richard Ashton

The pomegranate is native to the subtropics and mild temperate regions of South Central Asia. The first thing that must be addressed when thinking of growing pomegranates is climate. Pomegranates grow best in areas that have long, hot, somewhat dry summers and cool winters. Texas, California and Arizona are considered the best areas in the United States for pomegranates because of their climate but many other areas can and are growing pomegranates.

CLIMATE – TEMPERATURES

Now all of you who have average winter low temperatures above 12 degrees F do not have to worry too much about temperatures and can grow most varieties of pomegranates if you also have long, hot somewhat dry summers. That generally includes USDA cold hardiness zones 8b and higher. But those of you in areas with average low winter temperatures of less than 12 degrees F but above 7 degrees F need to look to cold-hardy variety selection, and those of you in areas with temperatures below 7 degrees F and above 3 Degrees F, need to look at only the most cold hardy varieties and then only in protected areas. There are also many people that grow pomegranates in pots and bring them inside in winter; a low growing variety is good for this. Two or three of the ornamental varieties will stand average winter low temperatures down to 0 degrees F but only a few of the ornamental varieties have any fruit and it is generally very small fruit. If you like the big showy flowers then a non-fruiting plant may be what you want.
Cold hardiness of different varieties:

Winters should be above 7 degrees F for the cold hard varieties, and above 12 degrees for the frost sensitive varieties. Most American, Mediterranean and Indian varieties suffer some damage at temperatures from 8.5-15 degrees F depending on variety, and at 0 to -2 degrees F most are destroyed down to the ground. Research in Turkmenistan on Central Asian varieties which are more cold-hardy, showed at 5 to 7.8 degrees F the upper parts and some buds of one-year sprays are damaged, at 1 to 3 degrees F, the skeletal branches are considerably damaged, and at -1 to -6 degrees F all are damaged. A few varieties are considered more cold-hardy. Frost-hardiness in cultivars is ruled by one important thing: hard-seeded varieties are more cold-hardy than soft-seeded varieties. If you are going to juice the fruit seed hardness should not make any difference, but if you are going to eat the fruit, it makes a lot of difference.

We are going to be discussing many American, Mediterranean, Indian and Central Asian varieties that are not available in most nurseries. We will tell you how you can get cuttings of some of these varieties for rooting later in this book under Propagation. You can grow your own plant that few, if any, in your area will have.

Here are some cold-hardy varieties: (all are hard-seeded except Papershell.)

Group A – Most Cold-hardy

Kazake, DK from Shevlan and Kaj-acik-anor

Group B – Medium Cold-hardy

Salavatsky, Surh-anor, Al-shirin-nar, Sakerdze, Bala Myursal, Nikitsky rannya, Entek Habi Saveh and Krmyzy-kabukh

Group C – Mildly Cold-hardy

Apsheronsky krasny, Kara bala Myursal, Papershell (soft-seeded), Skerdze, KaraKalinsky and most Iranian varieties.

Most of these varieties are from Central Asia and are held along with many others at the Germplasm Depository at the USDA/ARS at Davis, California.
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Although several of the cold-hardy varieties have been in the United States for over 20 years they are just now becoming more known and available to the general public.

**Frost Sensitive Varieties: (below 12 degrees F)**

Wonderful and most American, Indian (Asia), and Mediterranean varieties and all soft-seeded varieties (except Papershell). This includes most of the pomegranate varieties available in nurseries in the United States.

In addition, all pomegranates varieties can be damaged by late spring frosts that occur after new growth begins; the damage is less on growth on older wood than from 1-year old wood. Also sudden hard early freezes in the fall before the leaves are gone may result in some damage.

**WINTER CHILL HOURS**

Winter Chilling is not necessary for most pomegranates. Chill hours are the number of hours in the winter below 45 degrees (F). Some nurseries list 100-150 hours for chill hours for pomegranates but most pomegranates do not need any chill hours. Some of the more cold-hardy varieties are an exception and do need a little winter chilling for good fruit production. Many pomegranates are grown in semi-tropical areas that get no temperatures below freezing in the wintertime; such as the west central part of India where there are large plantations of pomegranates. There are also several varieties that do not loose their leaves in the wintertime and are considered evergreens. But these varieties cannot be grown in areas that have any significant freezing weather. As to high temperatures, there are no areas in the continental United States that are too hot for pomegranates. Pomegranates are even being grown in Hawaii where they are reportedly are doing well.

This does not mean that pomegranates do not need a rest period, they do if you want good fruiting. In west central India where the temperatures are not low enough to really make the plants go dormant, to cause dormancy the Indian farmers in the area have two methods. First, they do not water the shrubs and let them dry out, this forces the plants into a type of natural drought protection causing a rest period. If they have any rains in this period they pull the leaves off the plants which will also cause a rest period. They have even figured out that by removing
Plant and Fruit

leaves at different times of the year they can have fruit coming off year around. The brief rest period is followed by flowering and fruit set.

**CLIMATE — HUMIDITY**

A humid climate adversely affects the formation of fruit. During the bloom stage humidity can cause the flowers to not set any fruit. Pomegranates grow well in Florida but have trouble setting fruit because of high humidity. There are varieties that have been found to produce good fruit now in Florida but you must be very selective of varieties. If you get fruit to set, the growing fruit can stand higher humidity, so those of you in areas with somewhat dry late springs (when the blooms are appearing) can have pomegranate fruit even if your humidity gets higher during the summer. High humidity during the ripening stage may cause the fruit to split as it ripens. If you are using the fruit for juice this is not a problem just wash the fruit and juice it. Some of the different varieties have been tested for splitting. You can have less fruit splitting by choosing a variety with low splitting rates.

**CLIMATE — SHORT SUMMERS**

If you have over 180 frost free days and a hot summer you do need to worry about short summers. But there are areas in the United States that have average winter low temperatures above 12 degrees F and can grow pomegranates but the fruit will not ripen because of the short summers. Areas such as western Oregon and Washington and the middle section of the East Coast of the United States have this problem. Up until recently there were few remedies for this problem but with the importation of new varieties by the USDA we now have a number of early ripening varieties. Also, in recent years, there have been developed some early ripening varieties in California. There are the early ripening varieties Sverkhhranniy (means super early) which ripens in August, and Sumbar which ripens in late August or early September as well as several others. Sumbar and Sverkhhranniy are being tested in the Willamette Valley of Oregon where they should ripen well before the cool weather starts. See the Propagation Section for how to get a start of some of the early varieties or check with nurseries about early ripening varieties. Most of the early ripening varieties are also soft-seeded and most have a sweet taste. These soft-seeded early pomegranates do not store quite as long as others but usually will store for up to 3 months. The American variety Granada ® is an early
ripening variety (ripening in about mid-August) that might be of use in short summer areas. If you have a very, very short summer there is no answer but to grow in pots and bring inside to ripen.

**CLIMATE – HEAT**

Pomegranates like all the heat they can get. They grow in Saudi Arabia where the temperatures commonly reach 120 degrees F in the summer. Of course they need irrigation in these high heat regions to ripen fruit. In the United States commonly available pomegranates do best in areas where the temperatures are close to or above 85 degrees F for more than 120 days. The early varieties need less but still a fairly high number of warm summer days.

**CLIMATE – SPECIAL METHODS FOR WINTER COLD**

In Uzbekistan, Central Asia, they love their pomegranates and go to a lot of trouble to raise the fruit. Temperatures there can commonly go considerably below 0 degrees F. They have a remedy. In order to raise their prize pomegranates, they raise bushy varieties that they bend to the ground in the fall and pile dirt on them until they are completely covered. Then, the following spring they unearth the bushes. This is the unique way that they raise their cherished pomegranates. In the past, all the work was done by hand, but now they have machinery designed to do this work.

In areas of southern Russia where they have snow cover all winter they raise pomegranate varieties like ‘Agat’ which is a low growing variety. Under the snow cover ‘Agat’ can withstand much colder air temperatures.

Putting pomegranates under cover has been tried in Europe with good results. You do not have to keep them very warm (above 12 degrees F) so little heat is required. In the Midwest, pomegranates are grown in large pots and brought inside an unheated building (with some light) to rest for the winter, as an example. The building provided enough heat from the daytime sunshine to keep the nighttime temperatures warmer.

A high tunnel is a modern answer to raising wintertime low temperatures. A high tunnel is an unheated domed greenhouse. It extends the northern range of the pomegranate. This is the method that is used in Europe. When you see references to covered methods of growing pomegranates this is what they mean. They trap
some of the warmth of the sun in daytime which keeps the nights warmer. There are two layers of plastic applied over the structures to trap and hold the heat. The ends are usually opened up and the very bottom section of the sides is rolled up in the summertime to allow the heat to escape. In the fall they close them again (before any danger of frost) to help ripen the fruit with warmer temperatures. If you use this method just be sure that the humidity does not get too high, pomegranates do not like high humidity. Air circulation in and out will help reduce the humidity.

The next thing you must consider is site location; this includes soil, water and light exposure.

**SOIL**

Pomegranates grow best in fertile, deep, loam soil that is rich with humus – this type of soil is good for many types of fruit trees. The difference between pomegranates and many other fruit trees is the wide range of soils in which the pomegranate will grow. From heavy clay, black earth, lime rich soils, dry rocky hillsides to sandy soil, the pomegranate will grow. The pH tolerance is wide, from 4.5 – 8.2 (from moderately acid to moderately alkaline) although the best growth is in the pH range of 5.5 to 7.2. Production is less on highly sandy soils unless a fertilizer program is followed. Heavy clay soils tend to lighten fruit color but if the fruit is for home use this should not be a problem. The pomegranate is considered a salt-tolerant plant, but accumulation of salts in excess of 0.5% is harmful (this is way above what the average gardener will find.) If you live in an area that has high salts in the soil or water, plant the pomegranates on raised beds so the salts can drain away. Pomegranates like a well-drained soil and although they can stand brief flooding, constant wet feet will kill the plants. If you live in an area that has a lot of rainfall that is good as long as the water runs off and drains away from the roots of the plants. In heavy-rain areas it is again advisable to plant your pomegranates on raised beds.

**WATER**

Pomegranates trees can withstand drought periods but the fruit suffers and either falls off or is small. Water requirement for the pomegranate is variable depending on when and how much rainfall occurs. On average pomegranates need about 45 inches of water per year; this is not an absolute figure as it again depends
The Incredible Pomegranate

when precipitation occurs. If you receive most of your rain in the spring and early summer, then the need for irrigation is lessened, but some will still be needed if you have very dry weather in the middle of the summer. If you irrigate, give the plants a deep watering at longer intervals, versus shallow frequent watering. Dry winters are good and the need for water is not very great during this period although a little moisture in the soil is best. Remember they like moist, not wet, soil. Pomegranates can stand very dry air conditions but to produce good fruit they need some moisture in the soil. Fruit splitting is a problem if too much water is received by the plants after the fruits start to ripen. Many growers in the west stop irrigation in early August and allow the fruit to mature on what moisture is in the ground to avoid fruit splitting. Heavy rainfall in the fall when the fruit are ripening will again cause some of the fruit to split. The idea is to maintain level soil moisture throughout the growing season; it is the change in soil moisture that causes the fruit splitting. For the best fruit size, color and taste, keep your soil moisture at a constant level. Just remember, not too wet. As for irrigation, most commercial orchards are irrigated by the furrow system. Drip irrigation is also very good and maintains that level soil moisture that pomegranates like. Sprinkler irrigation is the least desirable of the three but will work. Try not to use this method when the fruit are ripening because if you get a lot of water on the ripening fruit a lot of the fruit will split. One advantage of sprinkler irrigation is that it can help prevent damage in late spring by frost. Just turn on your sprinklers during these frosty periods and you will get less frost damage.

Pomegranates can withstand long periods of drought, so if you cannot water, do not worry too much, the plants should survive. Just do not expect too much fruit.

In areas such as the southeastern United States where rainfall in average years is above what the pomegranates need, you do not need to worry too much about irrigation, but fruit splitting is a problem. Try to select varieties that have some resistance to splitting such as “Kazake,” “Salavatski,” and in Florida try “Christina.”

Again fruit splitting can be reduced somewhat by keeping even moisture in the soil. Spraying diluted Calcium Hydroxide after the fruit have set has shown to be helpful in preventing fruit splitting.
Pomegranates are sun loving plants that react negatively to excessive shading. They need at least 6 hours of sunlight per day for good fruiting. If you are planting more than one shrub, if possible align the shrubs east to west so that the sun will shine directly down the row all day. Just remember, too much direct sun along with high heat can cause the fruit to sunburn on one side; if this occurs, it is usually only a small percentage of the fruit and not a big problem.

Planting distances should be about 12-14 feet in the row and 17-18 feet between rows for best fruit production. If you have low fertility soil, the spacing should be further apart. You can plant closer in the row but it makes picking and cultivation difficult. Try to maintain a weed-free area between trees in the row. Cover crops can be utilized between rows. If you want a pomegranate hedge, plant them about 7 feet apart in a row; fruiting will not be as good but you will have a good dense hedge. Now, as to low-growing varieties, the spacing is somewhat different, you can plant as close as 5 feet with 12-14 feet between rows; such is the case with the variety “Agat”. The use of low-growing plants and close spacing has resulted in higher yields per acre in commercial production.

The next items that need to be addressed are Fertilization, Pruning & Training and Weed Control.

**FERTILIZATION**

Pomegranates need very little fertilizer unless you have a sandy soil. The only element that is commonly needed is nitrogen. The application rate depends on the age of the plant. The first year in a permanent location do not fertilize. The 2nd year apply about 2 ounces of nitrogen per tree is used. By the 5th year you should be adding 6 - 8 ounces per tree. A mature tree of 15 years needs about ¾ pound (12 ounces) of nitrogen per year. These figures are actual nitrogen so if your fertilizer has 21 % nitrogen (the first number in the three number set on the fertilizer bags) you will need about 2.3 pounds of fertilizer to get 8 ounces of actual nitrogen as an example. Just try to get a high nitrogen fertilizer such as ammonium nitrate. Fertilizer is usually applied in the winter. If you use too much fertilizer the fruit may not ripen well; it is better to use too little than too much. You do not want to fertilize too heavily and have all the energy of the plant going to growth rather than the production of many fruit. One of the best methods to fertilize pomegranates is...
to use natural fertilizers such as well-rotted manure and compost. I would highly recommend their use in preference to commercial fertilizers to the home gardener. There is little chance of over fertilizing with organic fertilizing products.

As to other elements, it has been found that many arid soils in the western U.S. are low in phosphate. If this is the case with your soil, it should be applied to bring it up to optimum. Usually one application will last for several years. Sometimes trace elements are needed, zinc in particular if the leaves of your plant show a type of unusual yellowing. Zinc should be applied by using a foliar spray in early spring. It is best to take a soil test to determine what your soil needs, and then you can adjust the soil with right amendments. Most states have a lab where you can send your soil sample to get it tested. Check with your local agricultural agent to find out where. Just remember that in many parts of the world pomegranates are grown with no commercial fertilizer although cover crops and natural fertilizers are commonly used.

**PRUNING AND TRAINING**

In its natural environment, the pomegranate is a shrub and the best method of training is to leave it a multiple-trunk shrub. Pomegranates can be grown as a single-trunk tree in the warmer sections of the country. To obtain good fruit, the plant must be pruned on a yearly basis to either a single trunk or the more desirable multiple trunks. Pomegranates have a tendency to sprout numerous suckers even when older, these must be removed. Pomegranates should not be pruned in any way the first year unless you plant a large potted plant. The reason for this is that the plants need to get established that first year without any more disruption than necessary. The second year, when they are more established, you should start your pruning and training. The first thing is to pick 5 – 6 good sprouts. This is the best number for good fruit production in most parts of the world. Any more sprouts than the desired number should be removed at ground level. You will need to remove the suckers several times during the growing season, trying to keep your plant to 5-6 trunks. If you let it sucker freely it will put all its energy into growing and you will have little fruit. The suckers can take so much of the energy of the plant that the established larger trunks will die back, especially in the early years. If you are trying to grow a hedge then let it sucker all it will, and it will.

Only if you are in an area with warm winters should you try to grow the pomegranate plant as a single trunk tree. You do this the same way you removed
the suckers, only leaving one sprout/trunk and taking away all others at the base. In time some of the trunks may die back or get injured. If any do, just pick a sprout from that year’s crop that is closest to the lost trunk and leave it for a replacement, and remove the old trunk.

It usually takes a few years for the 5-6 trunks that you are going to leave to become established. All heavy pruning should be done during the dormant/winter season, but some light pruning to open up the plants and remove suckers can be done in the summer, usually in August.

Pomegranates bear on both older wood (2-3 years old and older) as well as the current season’s growth. It is good during early pruning, before blossoming, to remove about ½ of the current season’s shoots and shorten the remaining current season’s growth a little so they will not flower. You want the fruit to be on the older wood. When pruning for best production when your plant gets older, remember this: the more light and air the blooms get the better the fruit set and fruit production will be. So when pruning the growth from the older 5-6 trunks, open up the middle and remove overlapping secondary limbs. Most of the fruit will be set on the outside of the shrub on new growth spurs from the older trunks. Care should be taken not to prune too heavily as that will reduce yields. Many commercial growers also top their plants at about 10 feet in order to make picking easier. Topping does not seem to reduce production and is recommended because it does make it a lot easier to pick the fruit and to apply any sprays for pests and diseases that may occur.

When plants get older and production starts dropping (20-25 years) cut the main trunks back to the ground and let some of the suckers come on and become the main producing trunks; this way you can rejuvenate your old plants. You may want to remove only a part of the old trunks each year so that you can have some fruit production until the new trunks mature. This does not work well with single trunk trees; in these trees, it is better to remove the entire trees when they get old and production drops and plant a new tree.

There are occasions when the entire plant will be killed to the ground by an unusually hard freeze. If this happens, remove the dead trunks and pick 5-6 sprouts to replace them the next year. In the first several years of life the pomegranate may experience several winters that they get frozen down, if you are in a marginal area. If you are in such an area, a mulch cover the first few years is good. Put the mulch on in the fall and pull it back in the spring. The pomegranate has a great ability to
re-sprout from the under ground part (xylopodium) of the plant. The xylopodium is the part that is at the beginning of the roots and at the base of the trunks, just underground.

There is one fact that is constant in all varieties – young plants are more frost sensitive that mature plants, so if you have trouble the first year or two with trunks being frost bitten, they should get more frost resistant with time. The good part about the 5-6 trunk system is that if you receive a harder than normal freeze (or early/late frost) on a mature shrub, usually only one or two of the trunks are severely damaged and you can still have fruit that year from the remaining trunks. You can then remove the dead trunks and let one or two sprouts replace them and you are back to normal. With the single trunk tree, if it is killed there is nothing left for fruit that year.

There is a dispute in the commercial pomegranate growing world as to whether a pomegranate should be grown as a single trunk tree or a multiple trunk shrub. In the San Joaquin Valley of California, commercial growers use the single trunk concept and think that it is the best. In most of the rest of the commercial pomegranate growing world, pomegranates are grown as a multiple trunk shrub. Some of the multiple trunk growers say 3 trunks and some say as many as 6. They all agree that the number of trunks must be limited to a small number, because if you let the plants go they will become a hedge-type plant and you will see little fruit. The one trunk system will work for anyone including commercial growers in areas that do not stand any chance of a very hard freeze that will kill the plants back. In the cooler winter areas, multiple trunks are the only way to be somewhat assured of production.

Pomegranates can be trained to a trellis system where the shrubs are planted more closely in the rows and trellised with supporting post and wires. This system has yet to show that it is any improvement and actually may lessen production as you cannot have as many trunks this way. Usually three trunks are utilized with one going each way in alignment to the row, as well as one going straight up, and the secondary growth tied to the wires. I have seen no results from this system yet so the jury is out.

**WEED CONTROL**

If you cultivate both ways you will have petty good control of weeds. Except with very young plants where you will not want to cultivate too close to the plant.
The weed control could be the old hand labor method or you can use a 6 inch or deeper layer of compost around the trees; making sure that you do not get it too close to the stem/trunks of the shrub.

If you use a drip irrigation system, you will probably only cultivate one way. That leaves a section between the trees that will have to be either hand weeded or you can use a herbicide. But herbicides can hurt young trees and are not recommend until the trees are at least 5 years old. There are alternatives. There are biological methods of reducing the amount of weeds between the trees. Such as putting down a layer of compost in these spots at least 6 inches deep again will retard weed growth, also it is good for the shrubs. Some of the organic nursery supply companies sell products that will help with the control of weeds.

There are also the non-cultivated orchards that use mowers to cut the weeds down. You will still need to irrigate in these orchards and drip irrigation is best for this type orchard but sometimes flood irrigation is practiced. The production does not seem to be as good from these non-cultivated orchards but there have been no scientific studies so we make no recommendations about ‘cultivated versus non-cultivated’.

Now we get to the pollination and harvesting of the fruit.

**POLLINATION**

Pomegranates are self-fruitful, meaning that you only need one plant to have fruit. But the shrubs will benefit from cross pollination by an increase in production of about 30%. Pollination is usually done by insects as well hummingbirds. Although bees can help pollinate pomegranates they are not normally the main pollinators. And pomegranates flowers are one of the hummingbird’s favorites. There is little evidence of wind dispersal of pollen. Some varieties are better for cross pollination than others; this is known but no research data is available at present. So to get a better crop, plant at least two pomegranate shrubs. But even if you have room for only one, you will get a fairly good crop. Two shrubs of the same variety will work for cross pollination, although two different varieties are preferred.

The majority of the blooms occur from April to June and then their number decreases in the northern hemisphere. On the flowers the ovary is just a small rounding at the base when the flower opens. When pollination occurs, the ovary
swells and the calyx becomes a “crown” on the swelling ovary. The flowers can occur as singles or appear in clusters.

**PRODUCTION AND HARVESTING**

Seedling shrubs tend to drop their fruit the first few years of production and this is normal. Shrubs grown from cuttings are more likely to retain their fruit in those first few years. Most plants available in nurseries are grown from cuttings.

Pomegranates seedlings start bearing at the age of 3-4 years and cloned plants (from cuttings) start bearing at the age of 2-3 years. There are a few varieties that have even seen one or two small fruit the first year when grown from cuttings; the variety “Wonderful” is one of these early-bearing varieties. There is a difference in varieties in the time that production starts; some are late coming into bearing, with some of the Iranian varieties being an example. By the 5th year, the shrubs should be yielding 12 pounds or better per plant. Full bearing is usually achieved by the 10th year, although a small increase occurs up to the 20th year. There is great variation in the amount different varieties will yield, from very little to 400 pounds on a large older shrub. Most of the productive varieties will yield 60 to 100 pounds per shrub on a mature plant. Most commercial orchards around the world look to have a total yield of 6 to 8 tons per acre but again it varies a lot by variety. There also a variance in the production from year to year based on environmental factors.

You can have pomegranates ripening form August to the middle of October by using different varieties with different ripening times. The sweet-fruited varieties tend to ripen first, followed by the sweet-tart varieties with slight variances in both groups. The fruit do not all ripen at the same time and must be picked over at least twice, usually a week or two apart. Also, the fruit are not all of the same size and must be sized and graded if grown for commercial use. The larger sizes go to the fresh-fruit market and the smaller sizes for juice. If you are growing pomegranates for home use size does not matter much.

The fruit must be picked right before they are fully mature or they will try to crack open (there is variances in this problem by variety.)

When they give a metallic sound when tapped they should be ready to pick. This is when the soluble solids (SSC) reach 15% to 17%. “Picking” is actually accomplished by cutting the fruit from the shrub not pulling if off. If you pull it off
you will damage it and the fruit will not store well, so get some pruning snips and cut the fruit off. Cut it as close to the fruit as you can so that the cut stem will not damage other fruit it rubs against. Try to cut the fruit as close to full ripening time as possible because the fruit do not ripen off the tree although they get a little sweeter in storage. This is because of concentration of juice in the arils due to drying.

The pomegranate is comparable to an apple in its storage life. For anyone interested in commercial production, it is important to note that the fruit lose weight in storage, so sell your fruit as soon a possible. This weight loss depends on your method of storage and will be largest in fruit left at room temperature. The fruit is best maintained at 40 - 45 degrees F with a relative humidity of 85%; only clean undamaged fruit should be stored. Fruit can be stored for up to 3 months and still be saleable. If you are storing fruit at home the crisper of your refrigerator will keep the fruit in good condition for an extended time. For many of you, it might be best to juice the fruit you do not want to eat and concentrate it or make it into syrup. That way you have less to store and the juice concentrate can be reconstituted when needed or used in recipes.

If you are juicing the pomegranates, it is important to note that the juice makes up 45-70% percent of the fruit weight. The variance is because different varieties have different percentages of juice to weight.

Fruit size can be from 2 inches on the small fruited varieties and a few of the ornamental varieties, to more than 6 inches on the larger fruited varieties. Seed size and aril size varies with variety. You can have a small seeded variety that has large arils as an example; this trait being very desirable.

In mature trees you will get a heavy fruit load in some years after blooming, as with other fruit trees you will need to thin the fruit to get large size fruit at ripening time. Where there are groups of fruit that are touching remove one of the touching fruit and continue around the tree removing fruit until you have a more average fruit load. It is thought by some that if the fruit load is too much you will also have more splitting of fruit at harvest time. For commercial growers this is especially important because small fruit do not sell well and then only for low prices for juicing. Also by removing small twigs that are touching the fruit you can prevent scratches to the fruit, which will give you better appearing fruit. The best time to do this is about half way through the development of the fruit.

Now to the problems that can occur with insects, pests and diseases.
The Incredible Pomegranate

**INSECTS AND PESTS**

Pomegranates have few serious insect problems but there are over a 100 that can cause some damage.

A. The Pomegranate Butterfly – Virachola Isocrates lays eggs on the forming flowers which hatch into caterpillars and enter the fruit by way of the calyx (crown). They can be controlled by spraying a couple of times a month apart at flowering time using common fruit sprays for control of insects on peaches.

Also in other countries, Metacid 50 EC 1 ml/ltr (1 ml to 1 liter) or Carboryl 0.2% has been used to control this pest.

B. The Flat Mite – Brevipalpus Lewisi can cause a dark spots on the ripening fruit.

Dusting with sulfur in late June should control these.

C. Omnivorous Leafroller – Platynola stultana. This insect has become a recent problem in California. They appear sometime in June and enter the fruit later. These have been difficult to control in the limited areas where they appear a problem. Insecticidal sprays will kill the Leafroller eggs.

D. Aspergillus Castaneus can cause discoloration of fruits and seeds.

E. The Mediterranean fruit fly can also cause problems

F. The Pomegranate Pyralid Moth has done damage in Central Asia but there are varieties that are immune to these moths such as “Kazake” and “Purple”.

I would like to suggest that you try organic insecticidal sprays for insect problems and bio-fungicides for fungal problems. These are more environmentally friendly, for the few gardeners that have any of these problems.

The biggest problem with insects is that they may enter the calyx (crown end) and get into the fruit (by eating their way in) in many pomegranate varieties. The skin of the pomegranate is tough and few insects can enter through the skin. Having said that, it must be noted that there are varieties that have a more closed calyx (crown end) with which you will have less insect problems. Varieties such as “Kazake,” “Purple (Sirenevyi),” and “Salavatski” have little problems with insects.
I want to stress that most gardeners will have little trouble with insects. Most of the insect problems occur in areas where there are commercial orchards and a concentration of trees.

Pomegranates shrubs contract few diseases. Only one has been shown to be any great problem.

Heart Rot is caused by Alternaria solani fungus. It infests the blooms and grows into the inside of the fruit. The skin may appear to be good but when you hold the fruit, it will feel light and you will know that he interior is decayed. This fungus appears to manifest itself during the bloom period if there is a lot of rain. Removal of all dead wood and keeping the area of the plants clean seems to reduce this problem. If the problem persists use a bio-fungicide. I believe Gardens Alive carries one. A Copper fungicide sprayed in late spring/early summer after the majority of the fruit have set should also alleviate the problem. In other countries, Diathane M-45, or Captan 500g diluted 200:1 (200 parts water to one part chemical) in water sprayed on the shrubs just after fruit formation and again 3 to 4 times at 2 week intervals has cured this problem.

On an upbeat note, the pomegranate has been shown to be resistant to Cotton Root Rot. In areas where this disease is present you can raise little other fruit as most fruit trees are susceptible to Cotton Root Rot. The pomegranate can be grown in these areas.

There have been a very small number of reported problems with deer eating the leaves of the pomegranate but this occurs only in areas with high deer concentrations. This is not a problem in areas that have deer in normal numbers as pomegranates are considered somewhat deer-resistant. A cage around the plant or a deer fence as well as deer repellant sprays and sonic devices help with this problem but generally it does not occur.

Gophers do not like the taste of the roots and are not considered a problem. In areas with high gopher populations, pomegranates are a good choice.

**POTENTIAL**

The largest growing areas of the world are the Middle East, India, Central Asia, North Africa and southern Europe. The commercial production of the United
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States is small compared to these areas although there are increasingly more thousands of acres in production here.

The largest production in the United States is centered in the southern San Joaquin Valley of California. The demand is outstripping supply in the United States mainly because of the health benefits that have been discovered. It used to be that the pomegranate wound up as a decoration in a fruit bowl, but now it is highly sought after for eating or juicing because of the great health benefits. In the Middle East, the fruit is most often juiced and used for drinking or concentrated for use in recipes. The juice is becoming more available here because of one large marketing effort by a grower in California and as a result, pomegranate juice made from concentrate is available most of the year, but it is expensive.

The potential profit to be made by growing pomegranates should cause the growing areas to increase to the point where the ruby-fruited juice is a common as orange juice. The pomegranate’s health benefits in many ways outstrip orange juice. What the general public does not know is that there are many varieties of pomegranates and the juice that you get in the store usually comes form only one variety. There are sweet varieties that have no tartness which many people have never even tasted. There are varieties that have seeds so soft as to be hardly noticeable. All these factors give the pomegranate great potential.
There are great differences between varieties and selecting the right one for you should be done with care.

We will first survey different varieties around the world and then list those available through nurseries. Finally we will give you an idea of the many varieties in the collection held at USDA/ARS at Davis, California.

Though we know a great deal about pomegranates and their origins, there are a number of seedling varieties in the pomegranate growing areas that have no name other than “it just grew up there.” Most of these are of inferior quality but occasionally you find one that has good qualities. I have located several that fit into that inferior category and most tend to have large hard seeds and a very tart or sour taste. This leads me to conclude that selecting a variety with known qualities is the better choice. You will have many choices because today we have many great varieties available.

Most horticultural lists divide the pomegranate varieties into three categories — sweet, sweet-tart and sour. We prefer to include the seed hardiness in this and divide them into six groupings: 1. Soft-seeded sweet. 2. Soft-seeded sweet-tart. 3. Early varieties (mostly sweet). 4. Normal (harder) seeded sweet-tart. 5. Normal (harder) seeded sweet. 6. Sour (nearly always normal seeded.) Not all selections held at USDA/ARS Davis, California, have information about the above qualities as some have not fruited yet.

Some of these varieties have been in this country for only four or five years. If they arrived as cuttings, they are just now old enough to start bearing.
BY COUNTRY: POMEGRANATES AROUND THE WORLD

SPAIN

*A large volume of commercial production with these varieties:*

- Mollar – The best selling pomegranate in Spain, sweet good red fruit, productive. There are several sub-variety selections under this name.
- Valenciana – An early ripening sweet variety with moderate production.

MALTA

- Blanca – Medium whitish fruit, seeds are underdeveloped (nearly seedless), arils pink in color, productive.
- Dulce Colorada – Large red fruit, red arils, soft-seeded sweet, productive.
- Gorda de Jativa – Large red fruit, red arils, sweet, productive.
- Pignonencs – Large red fruit, small seed, normal-seeded sweet.
- Cagin – Large red fruit, very hard small seed, sour. Very good with sugar.
- Guiseppe – Large, red, sweet fruit with high production.

ITALY

- Dolce, Alappi, Dolce Nostrale
**CYPRUS**

- Zaitiki – Large sweet fruit with soft seeds.

**GREECE**

- Patras Acide– extra large, red fruit with very sour taste. Good for syrup.
- Patras Douce – large, red, sweet fruit. Productive.

**YUGOSLAVIA**

- Slatki Barski Nar – Early ripening, large, yellowish-green fruit with sweet taste.

**BULGARIA**

- Uzbekskii Sladkii (Uzbek Sweet) – Sweet fruit
- Nikiskii Rannii – Sweet-tart fruit, early ripening and early to produce. Very productive. One of the varieties held at the USDA/ARS Germplasm Depository in Davis, California.

**ISRAEL**

- Wonderful – the sweet-tart variety from the USA. High production with medium seeds.
- Asmar (black) – Dark purple almost black fruit. White hard seeds.
- Ras-el-Baghil – very large red fruit, early ripening, normal seed.
- Red Lufani – Red, large with normal seeds good production.
- Malissi – nearly seedless (called seedless), early ripening variety.
ARABIAN PENINSULA

- **Romman Chouall** – Medium dark almost black fruit. Sweet-tart flavor also grown in IRAQ.
- **Mellassi** – Large red fruit with soft seeds and sweet taste.
- **Cherabani** – Medium red fruit. Sour taste, the syrup is used for preparing beverages and foods.
- **Selimi** – large red fruit with sweet-tart taste and small seed.
- **Aswar (black), Ahmar (red) and Halwa are also grown.**

TURKEY

- **Hicaznar** – A large good producing variety
- **Ak-anar** – Medium yellowish-white fruit. Light seed and juice.
- **Kizil-anar** – Large red fruit with sweet-tart flavor. High production.

IRAN

- **Shahvar (Saveh)** – There are several locally named Shahvar varieties. They are red skinned very large fruit. They have a sweet taste with normal small seeds.
- **The USDA/ARS has several Iranian varieties.**

AFGHANISTAN

- **Kandahar Large White** — Extra-large yellowish fruit with sweet flavor. Early ripening.
- **Kandahar Large Red** – Extra-large red fruit with sweet flavor. Mid-season ripening. This variety is considered to produce one of the best fruit in the pomegranate world.
- **Kandahar Large Black** – Dark purple (looks black) extra large fruit with sweet-tart flavor. Also these make very large plants.
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INDIA

- Ganesh (means elephant) – The number one pomegranate in India. It is somewhat newly developed. Large yellowish-red sweet fruit with soft seeds.
- Mridula – A hybrid of Ganesh and a red Russian variety. Pink-red skin with soft seed and sweet taste. Replacing Ganesh as number one.
- Alandi – Medium red fruit with pink arils with sweet-acid taste.
- Patha – Large fruit.
- Spanish Ruby – Large red fruit. Came from the USA.
- Kandahari Hansi (same as Kandahar Large Red) – See Afghanistan.
- Bhagwa – Sweet soft seeded red fruit. Has resistance to black spot. Good for humid areas.

CHINA

- Cin-kwen e-liu, Cin-pehin e-liu are some to the varieties
- Echen – Large thin skinned (papershell) fruit. Sweet taste.

Most varieties in China are sweet tasting fruit.

TUNISIA

- Gabsi – Large yellowish fruit. Early ripening with sweet taste. Very productive.
- Tunsi – Medium red fruit. Dark red arils with sweet-tart taste.
- Chelfi – Medium red “seedless” variety.
- Djebeli – Very large dark red fruit. Late ripening sweet variety with very, very small seed.
MEXICO

- Granada de China and Granada Agria are some of the varieties in Mexico.

UNITED STATES

- Granada (pp) – Very early ripening variety, red fruit of medium size. Sweet with only a very slight tart taste. A bud sport of Wonderful.
- Early Foothill (pp) – Large fruit similar to Wonderful but slightly sweeter ripens just after Granada (pp). Low acid and high sugar content in the juice. This variety tends to be a little larger than Granada (pp.)
- Early Wonderful – Large dark red sweet-tart fruit that ripen a couple of weeks earlier than Wonderful.
- Wonderful – Bright red variety with sweet-tart flavor and medium soft seeds. This is the main commercial variety in the United States, the one you will find in the grocery stores in late fall. The juice is dark red and staining. The seeds are medium-soft. Very productive in the San Joaquin Valley of California. It is a frost sensitive variety.

TURKMENISTAN

There is a wealth of varieties that came from the Research Station at Garrigala in Turkmenistan (formerly part of the USSR). This formerly Soviet agricultural station was headed for many years by Dr. Gregory Levin who collected and maintained the largest collection of pomegranate varieties in the world. In an effort to preserve the most important fruit in his collection, Dr. Levin sent the best varieties to the USDA at Davis California through Dr. William Feldman in Arizona, after the collapse of the USSR. We will discuss these Garrigala varieties later in this chapter.
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POMEGRANATES AVAILABLE IN NURSERIES (In the United States)

The varieties listed may be available in several nurseries or they may be available only at one or two nurseries. There are a few nurseries that have selected some of the best local seedlings and named them also. There is only one variety that is found in nurseries throughout this country and that is “Wonderful.” It is not adapted to all areas and this should be noted for your variety selection.

- “Wonderful” – Large purple red (dark red) fruit with a glossy appearance and sweet-tart flavor. The juice is dark red and staining. The seeds are small and medium soft. Very productive plant. The leading commercial variety in California.
- “Granada (pp)” – Early ripening variety, dark red fruit of medium size. Sweet with only a very slight tart taste. A bud sport of “Wonderful.”
- “Spanish Sweet” (Papershell) Large pink fruit with soft seeds and sweet taste. Mildly frost resistant vigorous plant, very productive. Of course, thin-skinned fruit like the name implies.
- “Foothill Early (pp)” – Large fruit similar to “Wonderful” but matures earlier.
- “Ruby Red” – Large purple red fruit with a sweet-tart taste. Has fruit that ripen practically all at the time so picking is easier.
- “Early Wonderful” – Large dark red sweet-tart fruit that ripen a couple of weeks earlier than “Wonderful.”
- “Balegal” – Medium sized pink fruit with sweet taste. Selected by Paul Thompson of the California Rare Fruit Growers.
- “Cloud” – Medium sized fruit with greenish red blushed skin. Sweet juice of clear/white color. Developed by University of California at Davis.
- “Fleischmans” – Medium sized pink fruit with pink arils. Sweet soft-seeded variety. Selected by Paul Thompson of CRFG.
• “Francis” – Large sweet fruit with some split resistance. Good producer. From Jamaica. Frost sensitive.
• “Green Globe” – Large green skinned sweet fruit. Selected by John Chater.
• “Crab” – Large red fruit with sweet but very tart flavor. A UC-Davis selection.
• “Home” – Yellow red skinned fruit with pink arils. Sweet-sour taste. Another UC-Davis selection.
• “King” – Medium/large dark pink fruit with very sweet taste. Splitting fruit and poor production. Also a UC-Davis selection.
• “Phoenicia” – Large red-green fruit with sweet hard seeds. Selected by John Chater.
• “Sweet” – Large light red/pink fruit with very sweet taste. Early bearing productive plant. Frost sensitive.
• “Utah Sweet” – Large pink fruit with pink arils and very sweet taste. Very soft-seeded. The flowers are pink-orange which is somewhat unusual in a fruiting pomegranate. Selected by Mrs. LaBerta W. Bowler of Southern Utah. Reported to be non-staining.
• “Christina” – Dark red skinned fruit with pale pink arils. One of the few that bear heavily in the humid south. Selected by Bill Mahan of Port St. Joe, Florida.
• “Marianna” – Red skinned fruit with red arils. Variety good for the humid south.
• “Ambrosia” – Extra large pink fruit with purple arils and sweet-tart juice.
• “Eversweet (pp)” – Red skinned fruit with clear arils/juice. Non-staining. In some areas seems to be bi-annual bearer but may depend on area. A good variety for coastal areas. Patent Number 5418
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- “Sin Pepe” – (also called Pink Ice or Pink Satin) – Medium to large red fruit with light pink arils/ juice. Very good sweet non-staining juice. Very soft seed in fact the name Sin Pepe means “seedless”. The name “Pink Ice” was given because of the fruit punch flavor.

- “Parfianka” – Sold as Garnet Sash by a large west coast nursery. This great red fruit with soft seeds has a complex sweet-tart taste. Excellent. Plant is vigorous with heavy production.

- “Elf” – Red skinned fruit with dark- red sweet-tart arils on a medium/small size plant hence the name “Elf”. Very good for cooking.

- “Red Silk” – A Dwarf shrub with medium sized dark pink fruit. Sweet-tart flavor. Good production for this size shrub. From the UC-Davis program.

- “Favorite ®” – Red-orange flowers and is supposed to be a fruiting type. Very frost hardy will stand temperatures below 10 degrees F. From southern Russia. Selected by One Green World Nursery.

- “Russian” – (Believed to the Russian variety “Salavatski”) Very large red fruit with red arils and sweet-tart taste. Very frost hardy, reported to have stood a one time, short period -6° F freeze in Georgia. Selected by Dr. Chris Inhulsen.

- “Kashmir Blend” – Fruit red with yellow –green background. Large deep red arils with rich sour flavor. Normal seeds. Somewhat dwarf but heavy bearing plant. This is a good pomegranate to use to make syrup for cooking because it imparts an excellent flavor to meat and chicken dishes.

- “Nana” – Ornamental variety 3-6 foot tall nearly evergreen shrub for mild winter areas. Flowers are orange-red.

- “Haku-Botan” – Ornamental variety from Japan. Small shrub. Double white flowers and also bears white, mildly sour fruit in the fall.
NURSERIES SELLING POMEGRANATE PLANTS:

Dave Wilson Nursery (Wholesale Nursery)
19701 Lake Road
Hickman, California 95323
800-654-5854
Website: www.davewilson.com

We have included Dave Wilson Nursery here even though it is a wholesale nursery. You can go to their website and see the list of retail nurseries that buy from them to see if there is one near you. They currently sell 9 varieties of Pomegranates.

Raintree Nursery (On site and mail order)
391 Butts Road
Morton, WA 98356
360-496-6400
Website: www.raintreenursery.com

Bay Laurel Nursery (Mail Order)
2500 El Camino Real
Atascadero, CA 93422
800-847-6473
Website: www.baylaurelnursery.com

Just Fruits and Exotics (On site and mail order)
30 St. Frances St.
Crawfordville, FL 32327
850-926-5644
Justfruits@hotmail.com
Website: www.justfruitsandexotics.com

This nursery has some local varieties that are better adapted to humid conditions.

Edible Landscaping (Mail order)
361 Spirit Ridge Lane
Afton, VA 22920
434-361-1916 or 800-524-4156
**The Incredible Pomegranate**

Website: [www.ediblelandscaping.com](http://www.ediblelandscaping.com)

This nursery sells one of the cold hardy pomegranates as well as a few others.

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**One Green World**  
28696 S. Cramer Rd.  
Molalla, Oregon 97038-8576  
1-877-353-4028  
Website: [www.onegreenworld.com](http://www.onegreenworld.com)  
Both Ornamental and Fruiting pomegranates.

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**Northwoods Wholesale Nursery (Wholesale)**  
A part of One Green World – noted just above.  
For people wanting commercial quantities.

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**Ingoldsby Nursery & Floral Shop (On site and mail order)**  
419 W. Hermosa  
P.O. Box 849  
Lindsay, CA 93247  
559-562-5949  
Website: [www.olive-trees.net](http://www.olive-trees.net)

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**Evergreen Gardenworks (Mail Order)**  
P.O. Box 537  
Kelseyville, CA 95451  
E-mail: bonsai@pacific.net  
Website: [www.evergreengardenworks.com](http://www.evergreengardenworks.com)

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This nursery has many ornamental pomegranate varieties and bonsai information.

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**Durio Nursery**  
1908 Parkview Drive  
Opelousas, LA 70570  
DEDURIO@Yahoo.com  
Website: [www.durionursery.com](http://www.durionursery.com)
This nursery has many of the ornamental varieties.

Pars Produce Co. (Mail Order)
3025 Roundhill Road
Alamo, CA 94507-1710
E-mail: parsproduce@aol.com
Website: www.parsproduce.com
This nursery has a number of the Persian pomegranate varieties.

Womack Nursery Co. (On site and mail order)
2551 State Hwy. 6
De Leon, Texas 76444-6330
254-893-6497
Sweet & Wonderful.

L. E. Cooke Co. (Wholesale)
26333 RD. 140
Visalia, California 93292
800-845-5193
E-mail sales@lecooke.com
Website www.lecooke.com
For those of you needing large quantities.
Grenada, Sweet, White, Wonderful.

In addition to this list there are many nurseries throughout the South, Southwest and Pacific Coast that sell one or more varieties of pomegranates. Just check with your local nursery. Also you may be able to get cuttings (for rooting) of a local variety that has good fruit. Just ask your neighbors.

POMEGRANATES HELD BY THE USDA/ARS AT DAVIS, CALIFORNIA:

This is a list of pomegranate varieties held by the National Clonal Germplasm Repository of the USDA/ARS at Davis, California. Some of these are available in the form of cuttings by request in limited numbers. Requests for dormant cuttings should be tendered before December 1 for delivery in February. The cuttings are very limited and not all varieties are available. Cuttings are for
rooting — see Propagation Section for information as to how to root cuttings. We believe that the better distributed these varieties become the better the public will come to appreciate the wide range of beauty and taste of the pomegranate. The list is as complete as we can make it at this time, but as you have read earlier, not all the varieties have fruited because they are so new to United States. Some will have no descriptions and are included for information only. The DPUN is classification by fruit type and the number is the number of the variety. Careful consideration should be given when selecting any of the varieties with no information as there are 30 listed that are of the wild type and not considered good for fruit or ornamental purposes but have a good quality or qualities for hybridizing.

**ORNAMENTAL**

1. **DPUN 001 Double Red — White**— Ornamental with double red-white flowers.
3. **DPUN 003 Double Red #2** — Ornamental, Red flowers with slightly orange shade.
4. **DPUN 004 Orange** — Orange-red single flowers. Fruit very large, reddish orange. Rind medium thick. Arils large, pink. Juice pink, sweet-sour. Seeds medium hard. This variety should be in the fruiting section but we leave it here because of the ARS number.
5. **DPUN 005 Small Leaf** — Ornamental with small fruit.
6. **DPUN 006 Not available.**
8. **DPUN 008 Haku-taka** — Double red flowering ornamental.
10. **DPUN 010 Nochi-shibori** — Dark Red double ornamental flowers.
12. DPUN 012 Wild variety with ‘seed only’ in collection.

**FRUITING VARIETIES**

14. DPUN 014 Molla Nepes – Fruit sour-sweet with soft seeds.
15. DPUN 015 Parfianka – Bright red fruit. Arils pink/red. Great sweet-tart taste with very soft seed. Rated by taste tests as one of the best in taste. Productive. Excellent somewhat wine-like taste. High juice quality.
16. DPUN 016 White Flower – Double white ornamental flowers followed by yellow-green fruit, with small arils and hard seed.
17. DPUN 017 Dotch Legrelley – Ornamental with double red-white flowers.
18. DPUN 018 Hyrdanar x Goulosha – Semi-dwarf. Plants 3-5 feet tall with large fruit. Breed for high density orchards.
21. DPUN 021 Nana (Calif.) – Ornamental. Dense shrub, dwarf to 5 feet, usable as hedge plant. Flowers orange-red single. Fruit very small, red edible.
22. DPUN 024 Cana – Desert type from Palestine. Sweet.
23. DPUN 027 Daru – Wild type shrub. Spreading hardy, adapted to poor soils. Fruit small, globular, yellowish-green tinged with red. Arils deep red to pinkish-white, acid high (sour.) Used to make spice ‘Anardana’ and for medical purposes.
24. DPUN 028 Fleischman’s – Pink fruit with very mild tasty soft light pink arils. Juicy and fruity. Vigorous plant with large fruit and soft seeds, very
sweet. Selected and named by Paul H. Thompson in Fallbrook, San Diego County, California.

25. DPUN 029 King – Shrubby plant, somewhat shy bearer. Fruit medium to large. Arils and juice very sweet. Originated in Fallbrook, CA. Selected by Sam King.

26. DPUN 030 How Sweet It Is – A sweet variety.

27. DPUN 035 Vina – Very soft-seeded, pale arils, sweet. Pappershell type with pink skin. Originally from the Trappist Monastery, Vina, CA. Probably part of old planting of the original Stanford Ranch.


29. DPUN 038 Balegal – Large round pale pink fruit with very sweet taste. Selected by Paul H. Thompson.

30. DPUN 042 Pink — Pink fruit and arils.

31. DPUN 043 Mae – Also DPUN 87 – Productive with bright red fruit. Excellent taste. Medium to large fruit with sweet, tangy red flesh. Juice deep red, sweet-tart


Plant and Fruit

Quarter 1988: Small, yellow green, sweet rich light pink juice, dwarf, heavy bearing.

34. DPUN 046 Not available
35. DPUN 047 Not available
36. DPUN 048 Ambrosia – Fruit extra large, larger than Wonderful. Sweet-tart taste. Arils large and thick.
37. DPUN 049 Blaze – Showy plant and flowers. Fruit shinny red with tart red arils.
38. DPUN 050 Eversweet – Derived from common home-grown cultivar in Lebanon. Plants produce 2-3 crops of mature fruit each year in southern California, beginning in mid summer and continuing through late fall. Fruit sweet even when small and immature, flesh pink to dark red depending on ripening time. Patented: No.5,418, March 19, 1985 as cv. Armchat and later changed to Eversweet. Juice is said to be non-staining.
39. DPUN 051 Golden Globe – Large Golden fruit with red blush weighing up to nearly 2 pounds, green sweet, hangs down like a chandelier, will split if left too long on tree. Large pink-red arils.
40. DPUN 052 Green Globe – Medium large fruit with hard seed.
41. DPUN 053 Loffani – From John Chater.
42. DPUN 054 Loulou – Small sweet fruit.
43. DPUN 055 Phoenicia – Large fruit, uniform red with a little green on skin. Sweet with just a very little tartness. Has Heart Rot problems in humid areas.
44. DPUN 056 Purple Heart – Good sweet-tart taste. Normal seed.
45. DPUN 057 Rosamia – Similar to Eversweet in size and taste but produces single crop.
48. DPUN 060 Al-sirin-nar – Big candy apple red glossy fruit. Big rosy-pink arils, sweet tart juice with good balance, juicy. High production, with one
of the highest total weights of fruit in the first 10 years. Vigorous, fast growing. Hard seed but a very good variety for juice. High juice quality. Resistance to fruit sunburn. Very decorative fruit with their glossy red color. JUICE VARIETY. Commercial possibilities.

49. DPUN 061 Kaim-anor – Medium pink-green fruit with bright red blush containing red arils and dark red sweet juice. Sweet to slightly sweet-tart taste. Arils pop out of the fruit with unusual ease. Fruit ripen in early to mid-October. Hard seed. An Azerbaidzhan variety. Resistance to pests and diseases.

50. DPUN 062 Salavatski – Large pink fruit with pink arils. Taste is sweet-tart fruity. Medium hard seeds snap in mouth, interesting. Average production. High cold hardiness.

51. DPUN 063 Kaj-acik-anor – An Uzbek-Tadzhik variety, makes a large plant. Fruits are large and round. Long keeping fruit. Plants yield about 110 pounds each at maturity. Juice 16% sugar and 1.4% acid. VERY COLD HARDY.


53. DPUN 065 Apseronski krasnyj – Bright glossy red skinned sweet-tart variety with normal seed. Very decorative fruit. Resistance to cracking.

54. DPUN 066 Kara bala miursal – Big very red fruit. Speckled sweet-tart arils, hard seed. Heavy bearing. A bud sport of Bala miursal with better flavor.


56. DPUN 068 Zubejda (Denau) – Sweet-tart. Normal seeded.


60. DPUN 072 Apseronski – Sweet tart variety. Normal seeded.


62. DPUN 075 Surh-anor – Very cold hardy. Highly productive. Normal seeded. Grown in the same areas as Kazake so believed to be a hybrid of Kazake.

63. DPUN 076 Alk Pust Ghermez Saveh – Sweet and mildly tart red skinned fruit.

64. DPUN 077 Tabestani Malas Biranden Saveh — means ‘— summer from Saveh.’

65. DPUN 078 Dorosht 5 hahanshahi Khoramabad – means ‘Big fruited from Khoramabad.’ Hahanahahi means ‘ belongs to king.’


67. DPUN 080 Shirin Pust Ghermez Saveh – Sweet red skinned fruit.

68. DPUN 081 Wonderful – See DPUN 037

69. DPUN 082 Sin Pepe – Name means ‘seedless’. Also called Pink Ice and Pink Satin. Medium pink sweet fruit with very soft seeds. Has a fruit punch taste hence the nickname Pink Ice. Excellent.


74. DPUN 087 Mae – See DPUN 43

75. DPUN 088 Elf – See DPUN 45

76. DPUN 089 Eve – See DPUN 44


80. DPUN 093 Palermo – Fruit large to extra large, round, red-yellow rind, flavor rich-tart, slightly acid. Introduced in the early 1980’s from Italy.

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82. DPUN 096 Mahali Dezful – Dezful local variety.
83. DPUN 097 Shirin Pust Siah – means ‘sweet peel from Siah.’
84. DPUN 098 G13168 – Open pollinated seed from the dwarf cultivar ‘Nana.’ Mature height about 6 feet. Flowers single, bright red-orange. Mature fruit orange-red, 2 inch diameter. Ornamental and almost evergreen in mild climates.
85. DPUN 099 DK From Shevlan – Very Cold Hardy.
86. DPUN 100 Koinekasyrskii Kislosladkii Krasnyi – Red fruit.
87. DPUN 101 Kukurchinskii – Tiny elongated fruit. Goes into dormancy early.
88. DPUN 103 Shrin Zigar – Productive. Pinkish very round fruit with mild sweet taste. Chewable large seed. From Bulgaria.
90. DPUN 105 Agat – Medium-large fruit. Soft-seeded, sweet-tart taste. Low growing. Heavy production. Developed in Russia for winter snow-covered areas.
92. DPUN 107 Gissarskii Rozovyi – Very soft-seeded, sweet and mildly tart. Pink skin. Rated very high in taste tests.
95. DPUN 110 Podarok – Soft-seeded, sweet-tart. Other reports have this as a hard seeded variety probably caused by cross pollination. Name means ‘gift.’ Very productive.
96. DPUN 111 Shainakskii – Soft-seeded, sweet-tart.
97. DPUN 112 1/25 Ranii – Gold with pink skinned fruit. Early ripening, juicy, sweet soft-seeded fruit.
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98. DPUN 113 15/4 Pamyati Rozznova – Red fruit with sweet-tart tasting arils, but the taste is mainly sweet. Large soft seeds.


100. DPUN 115 32/30 – Soft-seeded, sweet-tart. Continuous fruiting until late season.

101. DPUN 116 Vishnevyyi – Candy apple red with lighter arils, sweet-tart.


103. DPUN 118 Kara-Kalinski – Red fruit and arils. Very productive with good juice taste and nutty tasting medium hard seeds. High juice yield (60-70%). Medium cold hardy. Resistance to cracking. High juice quality and taste.

104. DPUN 119 Kolobok – Medium, soft-seeded fruit. Small arils, High juice yield (60-70%).

105. DPUN 120 Kubarchatyi – No information.

106. DPUN 121 Lyubimyi — No information.

107. DPUN 122 Turan — No information.

108. DPUN 123 Saharnyi – Purple-red, dark fruit. Tart.

109. DPUN 124 Parfyanka – Large light red sweet-tart fruit with soft seeds. Same plant as DPUN 015 Parfianka only younger plant. Someone changed the spelling a little is all. It is interesting to note that this young plant sustained some frost damage from a late spring frost in 2006 while the older DPUN 015 plant had very little damage. As the plants get older they have more frost tolerance.

110. DPUN 125 Ariana – Sweet-tart fruit but more tart than sweet. Soft-seeded.

111. DPUN 126 Girkanets – No information.

112. DPUN 127 Kemine – No information.


114. DPUN 129 Nisa – Light pink arils with sweet-tart taste.
115. DPUN 130 Messarian – Good sweet-tart flavor, soft seed.
117. DPUN 132 Sumbarskii – Soft-seeded with sweet taste.
118. DPUN 133 Hvalynskii – Arils and juice pinkish white. Normal seeded.
119. DPUN 134 Myatadzhy – Very sweet. Soft seeds. Seeds have nutty taste.
120. DPUN 135 Azadi – Very sweet, medium sized fruit. Name means ‘freedom’ in Persian. Peach colored gold fruit. Light pink sweet soft seeds with a little pleasant astringency.
121. DPUN 136 Syunt – Large sweet fruit and soft seeds. Arils and juice almost white. Insect/disease resistant.
122. DPUN 137 Andalib – Tart like lemon.
123. DPUN 139 Myagkosemyannyi Rozovyi – Pink with white arils. Semi-sour.
124. DPUN 140 Seidi – Sweet with white arils.
125. DPUN 141 Zelili – Small arils. Good flavor.
126. DPUN 142 Anvari – Pink arils, Sweet taste with normal seed.
127. DPUN 143 Sogdiana – Large with medium sweet complex taste. An interesting variety. Scores high on taste tests but has low production of fruit.
128. DPUN 144 Neozhidannyi – No information.
129. DPUN 145 Nusai – No information.
130. DPUN 146 Girkanskii – Dark red purple fruit with sweet-tart taste.
131. DPUN 147 Sumbar – Early ripening sweet fruit with soft seeds.
132. DPUN 148 Shihimderinskii – No information
133. DPUN 149 Gulistan – Light red fruit.
134. DPUN 150 Ovadan – Red fruit.
135. DPUN 151 Sirenevyi – Very soft-seeded, with complex sweet taste. The skin is pink but the arils are dark purple, quite a contrast. Large fruit. This one has a lot of potential.
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136. DPUN 152 Kopetdag – Yellow fruit with red blush.
137. DPUN 153 Kyz-Bibi – No information
138. DPUN 154 Chernaya Roza – Name means ‘black rose.’ Fruit small, tart with normal seed. The skin is very dark. Very high in Vitamin C. This would be a good variety for hybrid efforts.
139. DPUN 155 Kara Gul – Purple nearly Black. Kara means black.
140. DPUN 156 Parfyanets – No information
141. DPUN 157 Chandyr – No information
142. DPUN 158 Balkan — No information
143. DPUN 160 Gulyalek – No information
144. DPUN 161 Chemen — No information
145. DPUN 162 Sverhrannii – Early ripening. See DPUN 013
146. DPUN 163 Machtumkuli – No information
148. DPUN 165 ARM-02-001 – From seed collected in Georgia (Caucasus). Fruit Green flushed with red.
149. DPUN 166 ARM-02-195 – From seed collected in Georgia (Caucasus). Shrub, rounded, 15-18 feet with green red fruit.
150. DPUN 167 Ink – A very dark purple nearly black fruit.
151. DPUN 168 – From seed collected in Georgia (Caucasus).
152. DPUN 169 Toulumne Papershell – Papershell means thin skin, otherwise no information.
153. DPUN 170 GE-2004-182 – From seed collected in Georgia (Caucasus).
154. DPUN 171 GE-2004-178 – From seed collected in Georgia (Caucasus).
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155. DPUN 172 Granada (patented) From a bud sport of Wonderful. Has similar characteristics as Wonderful but ripens about one month earlier. Not as tart as Wonderful.

156. DPUN 173 Pride – Semi-tart fruit with gold skin, vigorous. Excellent taste.

157. DPUN 174 White-Seeded – (New) no information.

A number of these selections are available in nurseries, including most of the American bred varieties and a few of the Central Asian varieties as well as some of the Japanese ornamental varieties. But if you want to get cuttings to root of the varieties not commercially available see the Propagation Chapter where there is information on how this may be accomplished. The USDA/ARS is trying to spread the germplasm (selection of varieties) of pomegranates to help preserve them, but it does not desire to send cuttings of varieties commercially available. Members of the California Rare Fruit Growers may be able to trade with other members for some of the rarer varieties especially in Southern California. There may also be cutting exchanges with the Southern Fruit Fellowship members, a sub-section of the North American Fruit Explorers. See the Contact Section organization’s contact information as well as contact information for some of the nurseries that sell pomegranate plants.
CHAPTER V: ORNAMENTAL POMEGRANATES

Richard Ashton

All ornamental pomegranates are dwarf in size and grow from 1 to 10 feet in height depending on the variety. Every year these small ornamental pomegranates produce many showy flowers on an attractive shrub with glossy green dense leaves. Some varieties have small fruit; some have no fruit at all. The small fruit are very decorative in fall and early winter. The dried fruits can be used in potpourri mixes, together with flower petals. They are also attractive for many craft projects. The fruit are edible but there is so little there it just seems better to use them as an ornamental object.

Ornamental varieties have limited adaptability. Some will only stand temperatures as low as 18° F while others will survive at 5° F or less. Generally the ornamental varieties are more vulnerable to cold than the regular fruiting types; it’s best to pick your variety for your climate. Check with the nurseries selling mainly ornamental pomegranates for cold hardiness by variety.

The care and maintenance of ornamental pomegranates is the same as for the regular fruiting types with the exception of pruning. Pruning is limited to shaping; most people do not prune suckers and let the plants form a dense small shrub. Ornamental pomegranates bloom on new wood so it is best to prune and shape to boost new growth and as a result, you will have more blooms. But you want to be careful not to prune too much if you want a good flower display.

With their small size, these dwarf shrubs can be grown in pots and brought inside in winter in the cooler sections of the country. The blooms on most ornamental pomegranates are double but there are a few that produce only single flowers. The colors of the flowers are from white to dark red with many shades in between some even are two-tone. The blooming period is very long so they will continue to put on a show well into summer and a few blooms may appear in fall although this depends somewhat on the variety selected. Since pomegranates are of
medium drought tolerance, they can be planted where you want a show of flowers but where, occasionally, there are dry periods. Of course, your plants will flower better if soil moisture is maintained at a constant amount.

**ORNAMENTAL VARIETIES:**

1. **Nana** – This is the most common dwarf ornamental pomegranate. It forms a small compact bush with red-orange single flowers. It is very common to use this variety for a bonsai plant. It grows to 3 to 4 feet tall by the same 3 to 4 feet wide, a nice compact shape. It flowers very young and bares small 2” orange-red fruit. This variety has been grown in gardens since the early 1800’s. There are so many seedlings that have been grown from this variety that some plants sold as “Nana” do not have the true characteristics of this variety. The true plant is cold hardy to USDA zone 7 and possibly 6b where it has been reported growing. This variety is evergreen in mild climates but will loose its leaves in winter in cooler climates.

2. **Haku-Botan** – This variety comes from Japan as do many of the ornamental types. The white double flowers have light yellow cast but are mostly white. It bears small fruit with sour juice and medium hard seeds.

3. **Nochi-Shibori** – This medium-to-dwarf shrub from Japan bears carnation-like double orange-red showy flowers. It does not bear any fruit. If not pruned it can reach 10 feet. It is cold hardy to USDA zone 7 which is more cold hardy than most.

4. **Double Red** – Double red showy flowers. Some small fruit with sour juice.

5. **Orange Master** – Dwarf less than two feet with showy orange-red flowers. It bears some small red fruit.

6. **California Sunset (same as Mme. Legrelle)** – Long-blooming plant with cream-colored red-striped very double flowers.

7. **Ki-Zakuro** – Dwarf with very double flowers of orange-red alternating with white edges. This is one really puts on a show. From Japan.

8. **Toryu-Shibori** – Apricot double flowers.
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11. Double Red #2 – It is double red but the flowers have orange shading.
12. Alba Plena – Double white flowers with cream to yellowish cast.
17. Tayosho – Apricot colored double flowers. Small fruit.
19. Dotch Legrelley – Double red flowers with white-orange tones.
21. Hyrdanar X Kirmizy-Akbuh – Semi dwarf ornamental. Plants 3 to 5 feet high with average sized fruit.
22. Flavescens – Yellow flowers over a long period.
24. Agat – I have included this variety here because it is a dwarf but a very productive plant of medium/large fruit. Considered a low growing, spreading plant, which makes it very showy. It was developed to grow in areas of Russia where there was a snow cover all winter. That way it could stand colder air temperatures (to which it was not totally exposed). If you want fruit but have only a small area in which to plant, this may be your variety. The fruit are soft-seeded with sweet-tart taste.
The double flowers of many of these varieties set them apart from the single flowered, regular fruiting pomegranates. But make no mistake, all pomegranate plants put on a beautiful show of flowering. There are some that have interesting foliage such as “Small Leaf” that sets them apart just for the leaves. Another nice quality of the ornamental pomegranate is that they ‘fit’ in a small area. Ornamental pomegranates can stand a little shade, but like their taller counterparts, they prefer all the sun they can get.

**DWARF POMEGRANATES AS BONSAI**

The dwarf pomegranate is a very good choice for bonsai. These plants fill all the requirements for bonsai. You will notice that many of the varieties of ornamental pomegranates have Japanese names and that is not a coincidence as for a long time dwarf pomegranates have been used for bonsai in Japan and varieties have been breed just for that purpose.

Dwarf ornamental pomegranates produce showy flowers and some varieties have small, golf ball sized fruit. In growing bonsai plants, considerable effort goes into training the trunk and limbs so that they achieve a gnarled (ancient) look. With the dwarf pomegranate, this look comes naturally and makes training a very easy task. The ancient look is what bonsai growers usually want; with the dwarf pomegranate you get that look without any effort. The small bright green leaves with red leaf stems make a marked contrast also. The dwarf varieties that produce fruit have another nice accent once fruit is set. Then, as the small fruit ripen, there is another color change with the bright hues of the ripe fruit. So for an easy bonsai plant the dwarf pomegranate is a natural. We have included several nurseries in the Contact Section that sell dwarf ornamental varieties.

**POMEGRANATES AS A HEDGE**

Pomegranates make a great flowering hedge. You can select a variety that grows to the height you want your hedge; this will eliminate a lot of pruning. The spacing of the planting will depend on the variety. If you choose a dwarf or semi-dwarf variety then the spacing will need to be closer, usually 2 to 4 feet, depending on variety. With the regular-sized plants, 6 to 7 foot spacing is generally recommended. Just let them grow with no sucker removal and they will form a dense, bright green flowering hedge. If you want a flat-topped hedge then prune them to the desired height. It is a beautiful sight to see a pomegranate hedge in full
bloom. The additional bonus is that you can plant pomegranates close to roadways where many plants have trouble with the dust, smoke and car exhaust fumes that usually stunt or even kill other vegetation. The pomegranate is tolerant and just keeps on growing.
CHAPTER VI: PROPAGATING POMEGRANATES

Richard Ashton

In this chapter we will discuss the propagation of pomegranates by several methods. The first, propagation by cuttings, is the most commonly used method for creating new pomegranate plants. The second, propagation by seeds, is several thousand years old. The third, by grafting, is not commonly used but can be easily done.

PROPAGATING BY CUTTINGS

Propagation by cuttings is the most common method nurseries use to produce a duplicate of the desired variety. In using cuttings, there are several ways to proceed. The first, ‘Rooting in Pots,’ is the way that most people follow when they only want to produce a few plants. The second, ‘Rooting in the Ground,’ is the method that most commercial growers and nurseries use to produce their pomegranate plants. Regardless of which method you use, you must first start by taking the cutting from an existing pomegranate. Hardwood cuttings, the most commonly used type, are usually taken in February in hardiness zone 8 or higher; in the slightly cooler hardiness zones they should be taken about 4 to 6 weeks before your average last frost. You will need a good pair of shears, with which you will cut eight inch (the very minimum length) to 20 inch cuttings of this years growth sprouts. Select growth about the size of a pencil. Suckers are good for these cuttings. So there is no confusion as to which is the top and bottom of the cuttings, it is best to cut the bottom with a flat (straight) cut and the top with a slanted cut; then you will know later which end is to go in the soil. If you select a tip cutting, of course the top will be the tip with no slanted cut. When cutting several from a 3 or 4 foot sucker, you will have to make two, close-together cuts to get the slant cut on top.
When you take the cuttings, put them in a plastic freezer bag with a single wet paper towel that is just damp enough to maintain the moisture in the cuttings. If you cannot pot or plant them right away, you can put your bagged cuttings in the refrigerator for up to two months.

1. ROOTING IN POTS:

You will need a pot of at least 1 gallon size or larger with good drainage holes so that water will not sit in the pot and sour during the rooting time. The first step is to prepare your pots. Wash them clean of soil and then immerse them in a diluted bleach solution of 1 part bleach and 2 parts water for just a few seconds. Then wash the pots twice with clear water to remove the bleach solution. If you do not wash the bleach off it will interfere with the rooting of the cuttings.

You will need a good rooting medium (soil) with which you will fill the pots. The medium we recommend is a seed starter mix from a garden center. If you want to make your own mix, try 1 part perlite to 1 part potting soil (do not get the kind of potting soil with any fertilizer in it as it was kill the young tender roots.) The point is to get a medium soil that will drain well and also retain a moist environment for the roots to develop. Some people use 50% backyard soil and 50% potting mix. If your soil is heavy this will not work, but if you have a nice light soil this is a viable option. A mix of 8 parts perlite to 1 part peat and 1 part vermiculite will work well and is important to rooting many cuttings but is not necessary here. The problem with this last mix is that you have to feed your plants after they start growing roots as there is no ‘food’ in this mix. A liquid fertilizer mixed with water is used with this 8-1-1 mix after the roots have started forming. This 8-1-1 mixture is important to rooting under mist which we will discuss later. Next, put the rooting mix in the pot and moisten it well in preparation for planting the cuttings, which we call ‘sticking.’

The next step for this method is to clean the cuttings by using a fungicide and bactericide. Or you can simply disinfect the cuttings with alcohol. Physan 20 is an inexpensive fungicide and bactericide that can bought in containers as small as 8 ounces for less than $8. To use this product, follow directions; we use 1 ½ teaspoon per gallon of water. Submerge the cuttings for about two to three minutes in this diluted solution then let them dry a few minutes on a clean paper towel or other clean absorbent surface. The other method is to use alcohol. You can use
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most any high strength alcohol, such as vodka or isopropyl rubbing alcohol. After using the alcohol you do not need to let the cuttings dry as alcohol is beneficial to the absorption of the rooting hormone, which is the next step.

Trials conducted in Spain using just plain cuttings planted in the ground with no rooting hormone, showed rooting percentages as low as 8% for some cultivars and as high as 100% for others. The point is that by using a rooting hormone, we can increase the low percentage varieties. In trials in Spain and India, it was found that the best percentage of rooting hormone is 12,000ppm or 1% indole butyric acid (IBA). This is equal to full strength Dip ‘N Grow (a rooting hormone sold commercially.) The dry powder rooting hormones just do not have enough of the hormone to do any good with pomegranates. As noted, some varieties— such as most of the sweet-tart and sour varieties— will root just fine with no rooting hormone. The soft-seeded varieties seem to need the rooting hormone most.

Start the planting stage by cutting off a small portion of the bottom of the cutting so you have a fresh cut and then ‘wounding’ the cutting by taking a very thin slice of bark off the bottom to about ¾ of an inch up on 2 to 4 sides. Then dip the bottom two inches (approximately) in your rooting hormone, such as Dip ‘N Grow. The reason we keep mentioning Dip ‘N Grow is that full strength it is just right for pomegranate cuttings. The time the cutting is dipped in the rooting hormone should last only about 5 seconds (any more and you get too much hormone.) With your rooting medium already wet, you can use a pencil to make a hole where you want the cutting to go. When you have finished the 5 second dipping, push your cutting into the hole you made with the pencil down to where 2/3 of the length of the cutting is in the rooting medium and only 1/3 above it. A 5 gallon pot is just right for the 16-20 inch cuttings that the USDA/ARS at Davis, California, sends; but if you have a one gallon pot you need about 10-12 inch cuttings in order to be able to stick then 2/3 of their length into the pot. I have had good luck by taking the 16-20 inch cuttings that the USDA/ARS sends and cutting them in half and then sticking them in 1 gallon pots. I usually root two to three cuttings per pot. Remember 8 inches is the minimum length for cuttings, so that they will have plenty of stored starch to last through the rooting period.

Once you have your cuttings placed in the pots (stuck), you will need to place them where they will get plenty of light and can be kept warm. The light can be a fluorescent light in your home. If using a fluorescent light, place the pot so that it is within 18 inches of the light so that your cuttings get the full benefit. You
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can also place your cuttings in a greenhouse or outside or on a window sill. The second thing is heat. Bottom heating mats that are sold by nursery supply houses help speed up rooting and that becomes very important in the hard-to-root varieties. One method that has been used is to place the pots outside with just the top part exposed and a heating mat underneath. There can be a problem with the tops outgrowing the forming roots and taking all the energy out of the cutting before it has time to root. This only occurs in a few varieties but it does occur. By putting the cutting pot outside with the heating mat underneath you have kept the tops from sprouting because of the cool air (late winter - early spring) but the bottom is warm, letting the roots form. Pomegranate cuttings root better and quicker if the soil medium is kept at 71 to 85° F. If you are rooting inside, then try to keep them where there is good air circulation as this helps to hold the leaf sprouts back a little. It is helpful if you have a heating mat but not absolutely necessary.

Keep a spray bottle of water close by so you can mist the tops about once a day with a light mist to keep them moist; you do not want them drying out. Remember to keep the rooting medium moist also.

You can also put a gallon plastic bag over the top of a one gallon pot to make a mini greenhouse that will keep the moisture around the tops and keep the medium from drying out. It can be held in place with a large rubber band. If you see any mold forming on the tops remove the plastic bag and spray with the dilute Physan 20 mixture (1 ½ teaspoonfuls to the gallon.) I have rooted both with and without the plastic bag and, if you keep the tops sprayed with a water mist about once a day, you do not need the bag and there is less chance of mold forming.

Now all you need to do is wait. Pomegranates are slow to root and may leaf out and grow for a period before substantial root growth occurs. Do not get in a hurry; let them have their time to root. When the weather is past the last chance of frost, the air is warm, and the cuttings have been in the pots for at least 6 weeks, put your pots outside in a shaded place. By this time you will not need to mist daily as your cuttings should be actively growing. Move them into full sun slowly. Be sure to water them as pots dry out in summer heat quickly. Let them grow until they become dormant in the fall and then remove them from their pots and plant them in the ground. You will need to mulch around the newly planted young pomegranates to protect them from the winter cold, the first year.
If you see some dieback of the tops in the spring of the following year, do not worry as they will usually re-sprout from the ground with new growth. Some dieback is natural with new plants in the cooler zones. Most likely, they are on their way to making you a great pomegranate shrub. If you are using a 5 gallon or bigger pot, you can leave them in the pot as long as you want.

Usually you do not try to transplant out of the pots before they go dormant in the fall as the new roots are very tender and do not harden until late summer. Having said that, I will say they can be transplanted as early as late summer if you are very, very careful and do not disturb the root zone. This is not recommended but it can be done. You have the option, once your pomegranate plant goes dormant, to over-winter it inside or plant it in the ground. If you decide to plant it in the ground as most people do, you can do it anytime during the winter. Be sure to mulch your plants well when you plant them in the ground, as these young plants are very tender and a very cold winter might kill the tops if they are not mulched or covered.

Again, it must be said that pomegranates are very easy to root but it takes time.

2. ROOTING IN THE GROUND

Rooting in the ground may be done in areas where the ground does not freeze during the winter, usually hardiness zones 7 B and up. You must have a good draining soil for this method—not necessarily fast draining soil, but water should not stand over 4 hours.

First you need to prepare your rooting bed. You will want to till the area and then dig a trench 12-15 inches deep by one foot wide. A one foot wide garden spade works well. Then till the dirt from the trench to a fine texture and put it back into the trench. What you are trying to accomplish here is to loosen soil around the cuttings for easier rooting. Then put down a black mulch sheet three feet wide, the length of the trench. The reason for the black mulch mat is that it absorbs heat from the sun and heats the soil to gives the cuttings an early start on rooting. The cuttings do not start to root until the soil gets above 58-60° F, by using the black mulch mat you can speed up the date the soil reaches this temperature. I usually split the mulch sheet down the middle where the cuttings will be stuck. When it gets hot in the early summer, I want to be able to take up the black mulch mat—this is the reason that I split it instead of just punching in holes for the cuttings. I
know that a few weeds will come through the split but they can be easily gotten rid of because they will only occur in that thin line with the cuttings. If you are in a little cooler zone, you can just leave the mulch mat down all summer and punch holes instead of splitting the mat.

Then you will put dirt on the outside of the black mulch mat to hold it in place and keep piling up the dirt on the outside edge of the mat until you have about a foot tall ridge all the way around the cutting trench. This is important for two reasons. First it lets you water the cuttings by flooding (if you live in a sandy area you may just be able to water around the cuttings with a hose) because we need to deep-water the cuttings as the roots are forming on the bottom of the cuttings, several inches below the surface. Just fill you trench canyon with water; with good-draining soil, the water should be absorbed in a short time. The second reason for the mound is that there are frequently late frosts in some areas; the mound will support plastic sheeting to make a kind of greenhouse to withstand these late frosts. Just leave the sheeting on during the period that frosts are expected and remove it when the forecast is for warmer weather. We have had late hard freezes and with the plastic sheeting and the black mulch mat there was enough heat build-up during the day to keep the cuttings above freezing that night.

Now that you have the bed prepared, it is time to get the cuttings ready. Wounding the cuttings a little at the base seems to help the rooting percentages. I make just a couple of short cuts in the last ¾ inch by just lightly cut the bark away in a very thin narrow strip. It’s like stripping the bark; you do not want to cut into the wood. The important thing is to expose the cambium layer as that is the only living part of the stem. The cambium layer is between the bark and the wood and is that greenish layer you see on the wood when you pull back the very thin bark.

Most cuttings do not need a rooting hormone if you use this method, but there are a few sweet soft-seeded varieties that will have low rooting percentages if you do not use the hormone. So if you are rooting cuttings with unknown properties, it is best to use a rooting hormone. One percent IBA/12,000ppm is the best percentage for rooting pomegranates. Dip ‘N Grow is 1% IBA and is just right for pomegranates if used full strength. There are other high-strength rooting hormones that can also be purchased. A five (5) second dip is the recommended time for immersion of the bottom two inches of the cuttings in the rooting hormone - longer would be harmful for the cuttings.
After you have wounded them and perhaps used rooting hormone, it is time to put the cuttings in the ground. Have the soil loose and wet so it will be easy to push the cuttings into the ground. Do not put them in dry soil; you want the soil good and wet. Push the cuttings in the ground so that 2/3 of the cutting is below ground, but be sure you have at least two leaf nodes above ground, even if it is more or less than 2/3 in the ground. This is called ‘sticking.’ Set the cuttings 10 to 12 inches apart in the row. If you make double rows, make the rows 3 feet apart.

Now that you have your bed all set and your cuttings in the ground, it is time to wait. Be sure to keep the ground moist but not soggy wet. With most soil you will not need to water more once a week. The trench makes watering easy—you just fill it nearly up and let it soak in. In sandy soils where the water goes in quickly, you will not be able to fill the trench up so just use a hose and water around the cuttings.

It is best to leave the cuttings in the cutting bed until they go dormant in the winter, although some leave them in the bed up to two years. Most people dig them up and move them to their permanent place in their orchard when they are dormant that first winter. Now if you have a small place for your plants, just root them in the place you want them to be permanently.

3. ROOTING UNDER MIST

Usually, this method is used for summer semi-softwood cuttings by commercial nurseries and research institutions. We will cover it briefly as it is not a common method used by home gardeners. Most misting operations are usually carried out in a greenhouse or outdoors under shade in a location protected from the wind.

The cutting medium is usually a soil-less medium such as 8-1-1 (8 parts perlite, 1 part peat, and 1 part vermiculite); or 1-1-1, 1 part peat, 1 part sand, 1 part perlite. The peat is used to hold some moisture around the cuttings - you want all the excess water to drain away.

The temperature should be maintained at 71° or higher in the planting medium, which can be maintained by the temperature of the water you are misting with. If the water is too cold, you will have to use soil-heating cables under the medium. Wherever you place your mist operation, you should make sure the plants receive good light. In a greenhouse or outdoors this is usually no problem, but if
you have your mist operation indoors, you will need good fluorescent lighting suspended 12 inches above the tops of the cuttings.

You will need to be sure that the mist water has a way to drain as all that water can be a drainage problem. You will need a water timer. A 5 to 10 second misting interval every 5 to 10 minutes should be about right. Use a mist nozzle that covers the desired area. There are several types of nozzles available, so inquire about the right type for your operation. A waterline strainer should be used to remove particles that might clog the nozzles.

Now that we have discussed the setup, it is time to ‘stick’ the cuttings. Just follow the instruction in ROOTING IN POTS with the exception of the misting medium discussed above and the mist setup.

STERILE: To avoid problems such as fungal infections, try to keep everything you use clean. Think of it as handling food in the kitchen. Use a 10% bleach solution (nine parts water to one part bleach) to clean everything including the pots, your shears and your hands. Wash everything off with clear water a couple of times after using the bleach solution. Just do not get the bleach solution on the cuttings as it will oxidize the rooting hormone.

ROOTING HORMONE: I want to remind you again not to get rooting hormone on your skin but if you do accidentally, wash it off immediately. It is not that it is so terrible—it is just better to be safe. Read the label on the rooting hormone and follow instructions.

Note: Pomegranate plants grown from cuttings usually start to bear fruit by the third year, while those grown from seed do not usually fruit until the fourth or fifth year.

4. PROPAGATING BY SEED

Propagating by seed is the oldest method of growing new pomegranate plants, dating back several thousand years in horticultural history, and, currently, in use in several countries. Propagating by seed is not just the poor man’s method of producing new plants; depending on how it is used, it can be a very scientific method. Seed is the method used to hybridize new varieties of pomegranates. You
can also get plants that are mostly true to the variety by this method if you are careful with your seed selection as any seeds that are cross pollinated will not be true to type. Be warned that if you simply select a fruit without knowing where it came from, or the environment in which it was grown, you may find yourself with inferior plants coming from its seeds. Studies have shown that you will get a very wide variation in the type of fruit produced from pomegranates propagated by seed if no special care is taken. Many of these plants will be of inferior quality.

One way to obtain good true-to-variety seed is to bag the flower buds before the blooms open with big enough bags to allow for the development of the fruit. A good plastic bag will work if it is not kept on too long. Just as soon as the fruit are developed remove the bag or the fruit will mold. As pomegranates are self-fruitful, some of the blooms that are bagged with develop fruit and the seed from them should be true to variety. One other method used in many countries is to select the smallest fruit. The reason behind this is the belief that the small fruit developed later in the season when there were no pollinating insects around so these small fruit should be self-pollinated and seeds should be true to variety.

The seed from the selected fruit should be dried for long enough that the seed become very dry, usually 2 weeks is enough. Some say that you should put the seed in a closed container in the refrigerator for a week before sowing. Most varieties do not need this cold period but there are some cold hardy varieties that will benefit from the cold period. The soft-seed varieties usually can be sown immediately after drying. If you are going to store the seed for later planting it is best to store the dried seed in a closed container in the refrigerator.

If you believe that you have good seed, plant them in a flat in which you have a seed-starting medium, which is sold at many garden centers. Or you can use a fine potting soil that contains no fertilizer. When you have them planted, keep the flat in a warm place (70° F or warmer) with good light as well as water and in a few weeks you will have many little plants. Bottom heat will speed seed germination; seed as well as cuttings benefit from soil medium temperatures as high as 85-90° F. The germination period will vary a lot by variety but usually you should have plants emerging within 45 days, some varieties with germinate within 14 days. The soft-seeded varieties will germinate faster than the harder seeded varieties. The length of time to germination is also a factor of temperature; the higher temperatures will result in quicker germination.
The seed-planting flats with the plastic dome tops sold in many garden centers are very good for starting pomegranate plants from seeds. Once the plants reach three to four inches high they should be put in larger pots and placed outside if it is warm enough. I usually plant several plants to a pot so I can select the best one as time goes by, and to allow for plants that die. It is usually best to bring the potted plant inside the first winter before planting it outside the next spring. These seedlings are so tender that they sometimes will not stand the first winter outside. Once planted outside the spring of the second year, let your seedling grow through summer and fall and mulch well before the next winter. It should be developed enough by the next season not to need any special care, other than normal cultural requirements. Seedlings usually start to bear by the fourth or fifth year after germination.

5. PROPAGATING BY GRAFTING

Pomegranates graft very easily. The most finicky rooter will graft to another pomegranate rootstock and grow without missing a beat. We have been successful with cleft grafts, wedge grafts and whip and tongue grafts. Pomegranates are as forgiving as apples. I suspect that any viable grafting technique would work. If I had only an 8 inch cutting of a variety I really wanted, I’d cut off one node and graft it to a Wonderful or other vigorous pomegranate. I’d treat the remaining portion as you would any cutting to be rooted, giving yourself two chances of getting your desired plant.

If you are not familiar with grafting, there are several books on grafting and lots of information on the web will get you started. One of the best ways to experience grafting is to check with your county agricultural agent and see if any grafting classes are going to be held close to you. Going through a grafting class with ‘hands on’ experience is invaluable. The best time to graft pomegranates is in May with dormant scion-wood (cuttings) and in July with semi-hardwood cuttings.

We want to stress that grafting is not the best method of pomegranate propagation. Pomegranates sucker too readily for this to be a good method. For example, if you have a hard winter that kills the tops back to the ground, there goes your graft. In the warmer parts of the country, hardiness zone 9 or higher where you are growing the pomegranate as a tree (with one trunk) this method is a reasonable way to propagate.
Growers that have found a very special variety of which they have only one cutting will use this method to get it growing. Then, after there is good growth, they will take cuttings to root, and that way, they get more cuttings more quickly.

6. PROPAGATION BY LAYERING

You’ve now been introduced to the various common methods of propagation but I still need to mention that pomegranates can also be propagated by a type of layering. In the summer, take a sucker and bend it over so that part of the limb is touching the ground. At the point where it will touch, cut a thin short slit in the bottom side of the limb (when it is bent to the ground)—at least 1 to 1 ½ feet from the tip of the limb. Then dig a little depression and put the cut part of the flexible limb into the hole and put dirt on that area with a good-sized rock on top of it. The tip of the branch, still be connected to the mother plant, will be sticking out. That’s fine. Leave it that way through the winter, and in early spring after the mother plant has leafed out, cut the sucker between the mother plant and the buried portion. If it has rooted you will now have a plant growing on its own. The next winter replant it where you wish. This is just an interesting, easy way to propagate a variety you already have.

7. TRANSPLANTING

Once you have a plant growing, you can begin to think about transplanting. More plants are lost through poor transplanting methods than by any other part of the process of getting your pomegranate established.

Generally, transplanting is best done in January and February when the plants are dormant. You dig the planting hole bigger than the spread-out roots of the plant but only slightly deeper than the length of the roots. Place the plant in the hole with the roots spread out in a circle, then fill in about half the dirt. Press the dirt gently and water just a little. Then place more soil in the hole so that it is flush with the surface of the ground and the plant is at about the same height as it was in the nursery. Make a small ridge around the plant about three feet from the plant and fill with water. It is important to keep your young pomegranate plants watered at weekly intervals if you do not get sufficient rain, until they get established. The first winter following transplanting, mulch the plants to keep the ground warmer and to retain moisture in the soil. This will help if you have a very cold winter.
Now your plants should be growing well and on their way to having fruit.

8. TO GET CUTTINGS

You can get cuttings from friends that have pomegranates, people you seek out in your area that have a good variety, from a nursery or by trading cuttings with members of a fruit growing organization. Also many of the varieties that are mentioned in the Variety Chapter are only available through the USDA/ARS at Davis, California. To get FREE cuttings from them, if you have a computer, go to the website:

www.ars.usda.gov/Main/docs.htm?docid=12170

You will find yourself on the Pomegranate page. For an available variety list click on – PDF Catalog of available Pomegranates.

Then, to place an order, go to the above page and click on Products and Services that will take you there, then go to the bottom and click on – Order Form. Fill out the order form and send it in by the dates given and they will send you your cuttings at the appropriate time.

For those of you that do not have a computer, you can write or call them at:

National Clonal Germplasm Repository
University of California-Davis
One Shields Ave.
Davis, CA 95616-8607
Phone 530-752-6504 or Fax 530-752-5974

Tell them that you want to order pomegranate cuttings and they will help you.

Note: If a variety is available in nurseries, the USDA/ARS does not want to distribute cuttings of these varieties. Their goal is to distribute pomegranate varieties that are not available elsewhere in order to spread the germplasm (varieties) so that they will be better preserved and used.
CHAPTER VII: EATING, JUICING AND RECIPES

Richard Ashton

In this chapter we will address the use of pomegranate fruit. First, the principle use for the pomegranate in the U.S today is for juice. This has not always been the case. People didn’t know how easy pomegranates are to juice so they would eat some seeds or use the fruit for table decoration. When we think of oranges, we usually think of orange juice. In the future, we believe, the same will be true of the pomegranate. Our first section will deal with juicing the pomegranate. We will describe the fresh use of the fruit and discuss the easiest method to remove the arils. We hope that the recipe section that follows will expand your use of the pomegranate.

JUICING A POMEGRANATE

There are three methods for juicing a pomegranate. Number One is easy. The other two are here for information. Always start by washing the fruit.

1. Use a Citrus/Orange Press. Cut your pomegranate in half if you have a large citrus press and press out the juice as you would an orange. If you have the standard citrus press you may need to cut the pomegranates into quarters and then press out the juice. This is by far the fastest and easiest. When you have finished juicing your pomegranates let the juice set in the refrigerator a few hours. There will be a small amount of cloudy material in the bottom of the container that needs to be discarded and you will then have beautiful tasty pomegranate juice ready for drinking or any use. A warning: Do not use a citrus reamer as it will get some of the tannin from the skin and partition material into the juice and that is not desirable.
Plant and Fruit

2. Take the pomegranate and roll it around a little, until it gets soft, then cut apart the pomegranate under water. Remove the arils. Wrap them in cheesecloth or jelly sack then use your hands to squeeze out the juice into a bowl, squeezing gently as you do not want to squirt yourself. It is best to use small amounts of arils each time.

3. Follow the instructions for removing the arils and then process the seeds in a food processor or blender. Strain the juice through cheesecloth. Let the juice settle a few hours and remove any cloudy material from the bottom of the juice container.

An average pomegranate will yield about ½ cup of juice.

Another method that is used in Iran: Roll the pomegranate around, giving good pressure, but not enough to break the skin. It’s an art to push hard enough to break the arils inside without breaking the skin. When soft, carefully open a hole in the pomegranate and place a straw in and suck the juice out or just bite a bit of the skin out, spit it out and suck out the juice.

**REMOVING THE ARILS FORM THE POMEGRANATE**

This is simple and easy.

- Wash the pomegranate
- Cut off the crown
- Score the sides of the pomegranate
- Place in large bowl full of water, a bowl big enough for the fruit and your hands
- Try to open from the center, using outward pressure to pry it apart.
- Break apart the sections you have scored and roll out the seeds. The partition material and most of the skin will float to the top and the arils will go to the bottom.
- Remove the floating material and strain out the arils. And that’s it.
Putting the pomegranate under water does two things — First it prevents the arils from squirting juice on you and second it lets the skin and partition float to the top.

Another method is to cut the pomegranate in half over a large bowl then place half the fruit in the palm of your hand and squeeze gently (try not to squirt yourself). What you are trying to do is loosen the arils without breaking them. Then take a heavy wooden spoon or pin or other clean wooden object and tap the half where you have the arils loosened (it may take a hard tap); tapping the loosened arils into a bowl.

BASIC POMEGRANATE RECIPES

In this section we will present a few basic recipes that you can use to create many of your own special dishes. The simple fact is that most pomegranate recipes for using the juice are based on two basic recipes – heavy and light pomegranate syrup. But you can get creative with some very special recipes of your own by using these basics and then adding your own ingredients. If you are using fresh pomegranates for these recipes, you can usually count on one pomegranate making about 1/2 cup of juice, depending on size of fruit. We would like to note that there seems to be some confusion of just how pomegranate grenadine is made. First, grenadine that is used in drinks nowadays is not made from pomegranates as it was; it is artificially flavored. In the Mediterranean area and the Middle East where the heavy and light pomegranate syrups are used frequently, they are referred to as Pomegranate Molasses and Pomegranate Concentrate.

**Pomegranate Molasses (Dibs Rumman or Narshrab) – Heavy Pomegranate Syrup.**

This heavy syrup can be used in many ways. It can be poured over pancakes, ice cream and other deserts. Pour some in iced tea instead of sugar for a refreshing drink. You can think of many ways to use this great product. You can also buy this
already made in most Middle Eastern markets; the syrup was used in Middle Eastern cooking in much the way that wine is used in western cooking.

**Ingredients: (These may be increased in equal portions for any amount you want.)**

- 1 cup pomegranate juice
- 1 cup sugar

Bring to boil, simmer 5 minutes. That’s how simple it is to make pomegranate syrup yourself and it will keep in your refrigerator in a sealed jar for about four months. It works best to process the syrup into jars so that you can have it year-round. Pour in clean jars and use prepared clean canning rings and lids, then process in a water bath canner for 15 minutes. You can also freeze it; just leave a little room at the top for expansion.

**Pomegranate Concentrate – Light pomegranate syrup**

The difference between this and pomegranate molasses is that you do not use any sugar in this recipe and you have a more intense pomegranate taste. All you are doing here is concentrating the juice and making it into a syrup. Try using it in drinks both alcoholic and non-alcoholic. It can be used for many of the same things as pomegranate molasses—it is just a question of flavor, this being the less sweet and more tart of the two. You can also mix a little with specialty vinegar for a great salad dressing. It can be added to sauces, soups and marinades as well as many other uses.

**Ingredients:**

- Pomegranate Juice (that’s all)

If you want 2 cups of syrup start with 4 cups of pomegranate juice, as it reduces by about ½ of the amount you start with. Pour juice into sauce pan and bring to boil over high heat, then reduce heat to maintain boiling action for about 25 minutes or until it thickens, stirring to prevent sticking. When juice starts to thicken, check it to see if it is ready by lifting out the spoon. If the syrup it slow to drip off (like syrup) it is ready. It should be reduced to about ½ the original amount of juice you started with. This can be canned and processed the same way that you would can.
pomegranate molasses, or it can be frozen. When bottled and stored, the syrup stays good in a refrigerator for up to 2 weeks.

Note: If you want a heavier syrup you can reduce it as far as 3 cups juice to 1 cup syrup—it will just take a little longer cooking time.

**Pomegranate Meat Sauce**

This sauce is used to baste meats and chicken in the latter stages of cooking, usually added in the final 1/3 of the cooking time. Or just to add to the meat juices, especially if vegetables are also cooked with the meat.

**Ingredients:**

- 1 cup pomegranate juice
- ½ cup of lemon or orange juice (your choice, the taste will be a little different)
- 2 tablespoons sugar
- Salt and pepper to taste

In the sauce pan combine all ingredients, except salt and pepper and bring to boil on high heat. Reduce heat and simmer a few minutes (about 5-6). Add salt and pepper to taste.

**Pomegranate Bar-B-Que Sauce**

Use like any Barbecue sauce.

**Ingredients:**

- 1 cup thick ketchup
- 1/3 cup pomegranate molasses
- 1 teaspoon of cumin
- 2 teaspoons of powdered garlic or minced garlic
- 1 teaspoon of Louisiana hot sauce
In saucepan combine all ingredients and simmer 5 minutes on low heat. You want just enough heating to bring out the flavors. Stir to prevent sticking. It can be used immediately. You can adjust these ingredients to taste.

**Pomegranate Desert Sauce**

This sauce can be used to dribble over many desert dishes such as plain cake slices, ice cream, pancakes and many others, just use your imagination. If you use the sweet-tart type of juice you find in the grocery store you will have a sauce that has that good pomegranate taste. If you grow your own pomegranates, the sweet-tart or sour varieties are best for this sauce. If you grow or use one of the sweet pomegranates varieties reduce the sugar to 2 tablespoons.

**Ingredients:**

- 1 cup pomegranate juice
- 1/2 cup of sugar
- 1 1/2 tablespoons corn starch

In small saucepan combine ingredients over low heat. When combined and smooth, turn the heat to medium and bring to boil stirring constantly. It does not take long to come to boil. Boil 1 minute, you will see it turn to a thick sauce in just a few seconds when it starts boiling; keep stirring, do not let it scorch. Let it cool and it is ready. Store in refrigerator.

Try this sauce poured over thin slices of plain white cake (unfrosted) or pound cake. You will have people talking about it. There are many other uses for this sauce too.

**Pomegranate Jelly**

This makes a fine addition to any meal, especially breakfast. Just spread on toast for a great treat.

**Ingredients:**

- 4 cups of pomegranate juice
The Incredible Pomegranate

- 7 ½ cups of sugar
- ¼ cup of lemon juice
- 6 fluid ounces of liquid fruit pectin (this is one bottle of any brand of pectin)

Combine all ingredients except pectin in large saucepan. Bring to boil over high heat and immediately stir in liquid fruit pectin. Bring back to full rolling boil and boil for 30-40 seconds. Remove from stove and skim off the foam.

Spoon into hot sterilized jars to within ½ inch of top. Put on sterilized lids and rings, according to manufacturers instructions. Process in a water bath canner for 10 minutes.

Remove from canner and cool undisturbed for 24 hours. Label and store for later use. Makes 5 pints.

Pomegranate Wine

Ingredients

- 20 + Ripe pomegranates
- 1 lb. Barley
- 6 lb. Sugar
- 2 Lemons, juiced
- 2 Gallons of water
- Wine yeast and nutrient

Remove the arils from the fruit. Use 20 large pomegranates (5-6”) or 30 small pomegranates. Bring water to boil with barley in it. Simmer 5 minutes. In primary fermentation vessel combine pomegranate arils, sugar and lemon juice and stir until mixed. Pour the water through a strainer, off the barley water mixture (while still hot) and onto the mixture in the primary fermentation vessel. Stir well. When it cools off to room temperature, add the activated yeast and nutrient. Cover and let if ferment for 5 days. Then strain the mixture into the secondary fermentation jar and fit with fermentation trap. When the wine clears, rack and bottle. Useable in six
months but better wine if left a year. The tart or sour variety pomegranates make the best wine. With a good variety pomegranate produced and fermented under good conditions you will get a great fruity taste and aroma.

POMEGRANATE ARILS

Pomegranate arils can be used in many recipes or eaten fresh. They can be frozen and will keep for about 6 months in the freezer. The first thing I think of besides eating them is using them in salads. Add to your salad for an attractive and tasty dish. They can be added to meat dishes to give them a nutty pomegranate flavor; usually after the meat is cooked as a garnish. You can think of many things to add them too. Here is one interesting recipe:

Pomegranate Rice Pilaf

**Ingredients:**

- ½ cup pomegranate juice
- ½ cup pomegranate arils
- 6 oz. package of rice
- 1 onion chopped
- ½ cup raisins
- 1 chopped red bell pepper
- 1 tablespoon of cooking oil (your choice of oil)

Prepare the rice, following the instructions on the package. In a mid-sized skillet heat the oil. Put in the skillet the pepper and onion and sauté until tender. Stir in the raisins. Remove from heat. Combine with cooked rice. Then combine the pomegranate juice and arils. The seed from the arils give it a nutty taste.

It is ready to serve.
Freezing pomegranate arils:

When you remove the arils from the pomegranates try to get all the partition material away from the arils. As written earlier, it is best to do this under water in a big enough bowl that you can easily get your hands into the bowl to break apart the sections of the fruit. When you are finished and have gotten the arils drained away from the other material, try to get as much water as possible away from the arils. Put them in a plastic freezer bag and place in the fast freeze section of your freezer. By freezing the arils with as little as water as possible they will not stick together too badly and be loose and ready to use. You can use them frozen directly into many things. They should be good for 6 months or more in the freezer.

Try putting the frozen arils in a salad. They will start to thaw but will still be crunchier that they would be otherwise. Try them with you breakfast cereal for a crunchy, fruity boost. You don’t have to thaw them just put them in frozen.

FRESH POMEGRANATE JUICE

Drinking fresh pomegranate juice is by far the most common use of the nectar. You receive the many health benefits and have a great tasting drink. The juice taste will vary depending on which of the many different pomegranate varieties you have chosen or are growing. But as we have said before, chose the variety that has the juice flavor that you want – sweet-tart, sweet or sour. You will notice that I included sour in the three taste categories; I did so for a reason. Some of the sour pomegranates when juiced, with a little sugar added, make a great juice drink. The sour varieties of pomegranate juice make an excellent ingredient for light pomegranate syrup to be used in meat dishes. As to other uses for the juice, they are as numerous as your Imagination for creating meat dishes and adding a unique flavor to vegetables. Adding to drinks and making deserts—the list goes on. There are many, many recipes on the internet giving ways to use pomegranate juice as well as several books on Mediterranean and Middle Eastern cuisine that have pomegranate recipes.
Plant and Fruit

Try this simple juice recipe:

**Pomegranate Pomeade**

Use pomegranate juice with an equal amount of water and add sugar to taste with plenty of ice to make Pomegranate Pomeade. It looks like pink lemonade.

Just try your hand with pomegranates and the many avenues available to you. Start creating your own great pomegranate recipes.

**REFERRALS:**

- [www.pomwonderful.com](http://www.pomwonderful.com) has a wealth of information including many recipes.
- [www.pomegranates.org](http://www.pomegranates.org) The Pomegranate Council also has recipes and information.
Chapter VIII: Health Benefits

Richard Ashton

In the warm and sub-tropical areas of Asia and Europe, the pomegranate has long been a part of traditional medical treatments. The more contemporary researchers in the United States learn about fruit’s health benefits, the more attention is being paid to the pomegranate’s potential to provide antioxidants, counteract free radicals, offer tannins, ellagic acid and anthocyanins. In the next few pages, you will read a condensed version of these benefits; there are many other reference points you can consult to learn more.

What is a free radical? Free radicals are molecules in your bloodstream moving about with an unpaired electron. Because they are unpaired, free radicals are very unstable. They collide with other molecules seeking to acquire an electron and can start a chain reaction (mutation) leading to all types of problems and diseases. Free radicals occur through many natural and environmental sources: through aging, smoking, pollution, sunburn and many other causes. Antioxidants have the capacity to neutralize some of the free radical molecules.

Antioxidants include many vitamins and minerals that have the capacity to neutralize free radicals. The most useful for disease fighting are Polyphenol antioxidants, found in pomegranates in great numbers, making our fruit a great food product for your health.

Tannins are plant polyphenols that cause the tart taste in the skin of the pomegranate and are also found in smaller amounts in the juice. Tannins from bark were originally used to tan hides to make leather, hence the word tan-nins. Polyphenol antioxidants are contained in tannins—another way the pomegranate contributes to good health.

Ellagic acid is a phenolic compound, again an antioxidant, which is found in many fruits and vegetables with levels much higher in blueberries and pomegranates.
Anthocyanins are polyphenolic compounds that are found in many fruit. Anthocyanins give the color red or purple. The deep red/purple pomegranates are very high in anthocyanins/antioxidants.

I like to use the reference to the steel in a car body rusting out as it becomes oxidized. Antioxidants in pomegranates stop free radicals, like paint stops rusting. I know that anti-oxidizing of steel is not physiologically what is going on with the pomegranate antioxidants, but it seems appropriate metaphorically. The phrase, “Don’t set still or you will rust,” could be rephrased, “Free Radicals will age your body and cause diseases if you do nothing to stop them.” Start drinking pomegranate juice and stop some of those little rascals in your blood from wrecking your body.

The list of harmful occurrences that some people think are positively affected by pomegranates include:

1. Certain types of cancer. The connection is still being tested but malignancies thought to respond to what the pomegranate offers are cancers of the skin, prostate, colon, breast, pancreas and esophagus. We make no claim to the benefits of pomegranate juice but researchers appear to be very interested in the useful effects of the fruit’s properties.

2. Cardiovascular health, Heart Disease and Stroke. (This seems to be the area where most of the studies have been completed)

3. Aging (under study, but there are very positive signs of pomegranate help here.)

4. Alzheimer’s (under study)

5. Chromosome damage during radiation therapy and radiation damage by other causes. (known by the Russians for some time)

6. Diarrhea (folk medicine)

7. Liver Fibrosis

8. Promote wound healing (folk medicine)

We make no claim as to the effectiveness of pomegranates in relation to these problems. Pom Wonderful® has information at their web site www.pomwonderful.com on some of these studies.
What we think is that preventive medicine is best. So drink your pomegranate juice with pleasure and stay in better health than you would otherwise.

For the people watching their food intakes the following information may be helpful: One average-sized pomegranate contains about 100 calories with about 1.5g protein, 25g carbohydrates, 8-10mg vitamin C and 375 mg of potassium. Pomegranates are also low in sodium. These figures vary somewhat depending on the exact size of the fruit as one pomegranate is the serving size.

The following is an excerpt from *Pomegranate Roads: A Russian Botanist’s Exile from Eden*: published by Floreant Press, 2006, Dr. Gregory L. Levin. Dr. Levin is one of the world’s leading expert on pomegranates. Dr. Levin headed the Garrigala Agricultural Research Station in the former U.S.S.R. where he brought together and studied the world’s largest pomegranate collection with 1,117 accessions. Dr. Levin always interested himself in the historical information about pomegranates’ health benefits and the more recent nutraceutical advances. After the Soviet Union collapsed, he moved to Israel. We include Dr. Levin’s account here for those of you that have not seen it.

POMEGRANATES AS A CURE FOR ALL ILLS

By Dr. Gregory M. Levin

The pomegranate is a poly-vitamin, a unique machine producing a wide spectrum of biologically active substances – even more important for health in our polluted environment. Pomegranates are good for getting rid of waste from organisms including radioactive substances. It is tonic and restorative, prescribed after infectious diseases, surgeries, or as a general stimulant.

As an antioxidant, pomegranate ranks first, followed by peanut, wild strawberry, blackberry, carrot, and apple. In the former U.S.S.R., cosmonauts, pilots, submariners and coal miners drank pomegranate juice for maintaining good health and stamina. The monkeys on the Soviet biological research satellite had pomegranate-rosehip juice for
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vitamins. University of Oslo researchers now include the pomegranate in their list of “long life products.”

The pomegranate as a cure-all is nothing new. In ancient and medieval pharmacological manuscripts, it was valued as a powerful medicinal plant, used in folk medicines from Mediterranean countries to the East, and in Africa as well. Pliny, the Roman historian, considered the pomegranate to be universal medicine.

I believe that ancient knowledge of how to use medicinal plants should be a part of contemporary scientific data and our personal health regimes. If you collect folk remedies as I have, you’ll see pomegranates used for just about everything: asthma, coughs, colds, sore throats, laryngitis, bronchitis, respiratory infections, weight problems and diabetes, headaches, brain diseases, all kinds of heart problems, malaria, fever, colitis, hemorrhoids, large intestine problems, scurvy, jaundice, liver, kidney, spleen and gall bladder diseases.

As ancient Egyptian medical papyrus, probably dating from the 9th year of Pharaoh Amenhotep’s rule in the 16th century B.C., gave a compilation of data about medicinal plants that included the pomegranate among many remedies.

Hippocrates (460 – 377 B.C.) recommended pomegranate juice for stomach pain, and pomegranate rind for ulcers.

The pomegranate’s medicinal qualities were highly appreciated by Theophratus (c.372 – 287 B.C.) who was the father of botany; by the doctors Galen (c.130 – 200 A.D.), Dioscuri (1st century B.C.), Oribatius (325 – 430 A.D.), Paul of Aegean (7th century A.D.), Johann Damascean (9th century), Er Razi (850-932), Johann ibn-Masua (8th century – 9th century) and Mhitar Gheratsi (12th century.)

In his Canon of Medical Science, Avicenna (980 -1037 A.D.) mentioned pomegranates 150 times, considering all its parts to be medicinal.

Quatrains in the 16th century Rubaiyat praise the pomegranate’s medicinal qualities.
“Punicotherapy” (from Punica, Latin for pomegranates) is a familiar term in some parts of the world, especially in the countries of Islam and Buddhism. Some South Asian countries grow pomegranates as special medicinal raw material.

For many centuries pomegranate rind as well as the bark of the branches were used to get rid of helminthes (intestinal parasite worms). Its rind was used to treat stomach disorders, diarrhea, and dysentery. Korean folk medicine employed it to treat severe dermatitis.

Pomegranate fruit and other parts of the plant in various folk cultures are used for stimulating appetite and for indigestion, to treat other stomach disorders like dyspepsia, gas, nausea, regurgitation, hiccups, against spasms, dropsy, ovarian problems and shortness of breath. It is good as a painkiller. In India it is believed to be effective against leprosy. Indian folk medicine uses a pomegranate tonic for the nervous system.

During WWII, Azerbaijan produced lemon acidic sodium form wild pomegranates to be used as a blood preserver. In 1942, the compound was sent to Leningrad during the siege. That same lemon citric acid in pomegranate juice is used in treatment for scurvy and urine acid diatheses.

Pomegranate juice is good for treating arteriosclerosis and hypertension. It is well known as an excellent treatment for anemia.

You’ll find references to pomegranate treatment for kidney stones, arthritis, mouth, eye and ear diseases, night-blindness, rashes on the head, baldness, eczema and skin problems of all sorts, fractures, hernia, small pox, leprosy, burns, malignant tumors, infertility.

We find the pomegranate in love potions as an aphrodisiac and for virility. Pomegranate seeds’ rich oil has hormone producing effects and stimulates estrogen. If you needed a tranquilizer for nervous disorders or for snake and scorpion bites, you probably would have been prescribed some part of the pomegranate by your folk healer.
Contemporary phytotherapy, the science that studies the usage of plants and a wide spectrum of ailments, has a central place for the pomegranate. The rind has a suppressant effect on abdominal typhus bacteria, TB, intestinal dysentery, cholera and other bacteria that cause amebic dysentery. Every part of the pomegranate is being experimented with.

Pomegranate fruit has a high content of riboflavin – the B2 vitamin that normalizes the nervous system and is used against radiation sickness. It contains folic acid, steroidal estrogens, polyphenols, anthocyanins (having high capillary-strengthening activity), coumarin (responsible for hypertension,) anti-ulcer, anticoagulating, pain-killing, adrenalin-like bactericide, as well as anti-tumor action. It contains oxycoumarine (valuable in preventing strokes, thrombosis, clots, fractures in blood vessels); betatine (an anti-ulcer organic compound); tocopherol or Vitamin E that has anti-radiation and anti-mutation activity; phenolcarbon acids, amino acids, pectin, small amounts of two alkaloids, 17 micro-elements (including potassium, calcium, magnesium, molybdenum, copper, iron, cobalt, chrome, selenium, etc.). Iron and copper and chrome are valuable treating cardiovascular diseases.

Pomegranates contain arachidonic acid – an essential polyunsaturated fatty acid very rare in plants, and protocatechuic acid; both participate in prostaglandine synthesis, and consequently, play a certain role in the reproductive system. The leaves have tannins – being tried for antibacterial and capillary-strengthening effects. Decoctions made of its flowers, fruit and roots may find there uses as well.

Most contemporary research on pomegranate’s pharmacological and medical benefits is being carried out in Israel. There, nutraceutical companies are looking into the pomegranates’ use in estrogen replacement therapy, to fight breast cancer and prostate cancer.
CHAPTER IX: THE TASTE OF THE FRUIT

Richard Ashton

Taste is as different as the varieties you have been meeting, some perhaps for the first time. Most of the American varieties have taste information accompanying them but the foreign imports have yet to be tasted by most people, so we will give a few personal testimonials. Below you will find three different tasting reports done at different times, by different people. The first is by Barbara Baer of northern California who visited the U.C. Davis orchards at Wolfskill where the university and the USDA/ARS pomegranate orchard have collected the largest number of varieties in the United States, many from the Garrigala collection in Turkmenistan.

Pomegranate Tastings over two years, 2005-2006

Barbara Baer

In 2004, I arrived a few weeks too late for the U.C. Davis-USDA 3rd Annual Pomegranate Tasting. But greenhouse/orchard managers Jeff Moersfelder and Joe Wehrheim gave me a special tour. By the time I left the Wolfskill orchards adjacent to the university campus, I was nearly drunk from the sweet juiciness of all the fruit I’d tasted. There, for the first time, I met the Turkmenistan varieties I’d read and heard about from researching Garrigala and Dr. Gregory Levin. Then and there, I fell in love with Parfyanka and Girkanski.

I had to wait another year to meet these seductive varieties again at the tasting in 2005. The Turkmenistan pomegranates had produced enough fruit to be in competition for the first time since Dr. Levin had sent his most prized varieties
from Turkmenistan to Davis, officially one of nine National Clonal Germplasm Repositories. Dr. Levin had entrusted Davis with 60 varieties, 30 for taste, color and seeds, 30 for diversity.

November didn’t feel like November, however. There hadn’t been rain and a mini heat wave made the air feel more like Turkmenistan where autumn stays hot long after summer.

Jeff and Joe directed traffic with help from California Rare Fruit Grower volunteers who had been hard at work sucking dozens of pomegranates, 18 varieties in all. They’d prepared the tables so members and visitors could taste the arils glistening in little cups without having to do any of the messy pomegranate-seeding work. The red, rusty, green-stippled fruits, leathery in their late fall covers, lay before us with their common name and orchard identification numbers.

The nurserymen and growers seemed to know just what they were looking for in flavors, textures, and seed qualities, while I found myself wishing for better words than sweet, sweet/sour, sub-acid, tart. I marveled at the colors, size and flavors of the arils—coral, carmine, garnet, purply-plum, peachy pink—of the Turkmenistan varieties. I recognized my beloved Parfyanka and Girkanski—their taste as vivid as I’d remembered. I also got to experience Sogdiana, VKusnyii, and Sirenevyyi. People around me were saying words like tangy, astringent, refreshing, winy, hint of honey, words that opened up more of my palate.

“Dr. Levin’s fruits raised the bar,” Jeff said. He could see seduction going on before he read the tallies we were keeping.

I found that the pinker/yellowy fruit with blush-colored arils were the juiciest, and had such soft seeds they melted with sweetness in my mouth, but I kept returning to tangy Paryanka and VKusnyii for depth of flavor. I rated them tops.

Jeff led a caravan of eager tasters into the orchards where we were let loose to stroll between the trees and sample and gather at will. I went no farther than the rows of Turkmenistan varieties. In this transplanted paradise of pomegranates, the over-burdened limbs bent to the earth with their fruit as if begging, pick me, pick me. I kept picking, adding to my bags. The cracking fruit released a heady perfume, color and fragrance spilling over, making me imagine the pomegranates’ distant home in the Sumbar River Valley. I regretted I had not seen them there but at least I had this experience. When I cut my finger on a rough stem, my blood was
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the color of the juice. I thought of Queen Persephone in Hades who ate the six seeds that were too beautiful to resist. They married her blood to the Lord of the Underworld and started the seasonal round.

Weeks later, Jeff emailed the results: Turkmenistan varieties won the 4th Annual Pomegranate Tasting Sweepstakes with no close rivals. Dr. Levin’s entries had trumped the competition.

Jeff praised the USDA program that offered everyone at the tasting cuttings from any six varieties, free of charge, if they were requested by Dec. 1. The purpose of the government’s gift was to promote biological diversity: the more home gardeners grew different and rarer varieties of pomegranates, the more chance these unusual fruit would survive and spread from grower to grower. I remembered Jeff saying, “It’s only a matter of time before a pest or blight hits monoculture,” referring to the single Wonderful variety grown by Paramount Farms.

Top favorites at the Davis and the CRFG’s San Diego tasting, (Levin’s pomegranates by way of Davis.) were Parfyanka, Gissarskii Rozovy, Azadi—a Persian variety—Syunt, Sirenevyi, Kolobok, Sogdiana. Sweetness trumped soft seeds, perhaps because the honey-crisp flavors were unexpected. When Dr. Levin received word of his progeny’s success, he wrote that he was happy.

I ordering my seven favorite Turkmenistan varieties. In a few years, if the cuttings rooted and the trees did well in my northern California temperate zone, I would have my dream-come-true: Dr. Levin’s pomegranates in my back yard.

October 29, 2006

Can you ever be pomegranated-out? Late afternoon of the Davis tasting, after having shucked the fruit the day before, I had a moment of feeling that too much of a good thing might be possible. But the person who truly had seen a million arils over the past week was Jeff Moersfelder, and he was still grinning at the end of the day.

It was Moersfelder’s inspiration to have a pomegranate tasting in the Wolfskill orchards adjacent to the UC Davis campus. Nearly a decade ago, he became the curator of Dr. Gregory Levin’s collection from Garrigala in Turkmenistan before he knew anything about Dr. Levin or Soviet Central Asia. When the cuttings were released from quarantine, Moersfelder took great care of
the young plants, varieties with strange Russian and Turkmen names. He knew that they had come from afar and that it was his responsibility to help them flourish and become available to scientists, growers, nurseries and curious tasters in the future.

Last year, the dozen Central Asian varieties Moersfelder selected for tasting for the first time stole the show. Their intense flavors and small seeds bowled everyone over. Nothing, not Wonderful nor any other known variety, compared. This year, he chose 18 varieties both from the Central Asian block and also from the older trees, and spent most of the week collecting, sorting, shucking and bagging them in cold storage for the 50 or more people expected to attend.

Rain had been predicted but the morning of the tasting the sky was blue with feathery clouds, a perfect autumn day under a warm sun. The tables full of arils in their little cups glowed like gems, from the deep reds to the light pinks. Conditions in the orchard had been dicey all spring with a late, cold May rain that played tricks with pollination and maturation. The Central Asian varieties hadn’t produced as well nor ripened as fully as they had the year before. The longer-established varieties, mainly from the Chico collection, like Eve, Crab, and Cranberry had done better than many younger trees. Moersfelder speculated that these larger trees had used the later summer heat better, while some smaller trees hadn’t shaded fruit enough from sunburn and or stunted development. Kazake, one of the Turkmen varieties, had fruit half the size of last year, and very small arils, but the variety nevertheless retained its lovely, almost watermelon sweet taste.

The favorite among the tart/sweet varieties was again Dr. Levin’s Parfianka, with its thin seeds, deeply tangy/wine flavor, astringent and sweet in a single aril with a very thin seed. Sin Pepe got high marks for its crunchy, pop-in-the-mouth light sweetness. A surprising favorite was Crab, planted in the older block, not a Central Asian variety—big deep red fruit with excellent wine tart/sweet flavor. As usual, Dr. Malli Aradhya had instructive and fascinating information to impart. And David Karp, who had driven from the San Fernando valley with a Citron grower, introduced us to this very strange Biblical fruit. Iranian growers from the Central Valley brought their Savehs out after the tasting. The weather had delayed their full ripening as well, so the sugar hadn’t quite balanced the acid in the arils, but the purple black colors within the perfect red fruit were entrancing.

After the tasting, we were again allowed to roam in what is my heaven on earth, the Wolfskill pomegranate orchards. As I wandered among the trees, the heavy, ripe fruit, much of it cracked from rain, again made me think of too many
children hanging on their mothers’ arms. Perhaps the most magical experience happened to a first-time taster from Ft. Bragg who had brought his young daughter named Eden. They lingered to the last and had a picnic in the orchard, savoring the single sweet-as-crystallized-sugar “White Flower” that had stayed on the tree.

Below are the varieties we tasted. All these and more are available through the ARS/USDA program online at no cost. The cut-off date each year is December 1, so be thinking about ordering later in 2007. This is a great government service to promote biodiversity and enrich the pomegranate growing experience of all home gardeners:

- DPUN 0056 “Purple Heart”
- DPUN 0116 “Vishnevyi”
- DPUN 0066 “Al-sirin-nar”
- DPUN 0059 “Sakerdze”
- DPUN 0015 “Parfianka”
- DPUN 0082 “Sin Pepe”
- DPUN 0087 “Mae”
- DPUN 0081 “Wonderful”
- DPUN 0074 “Saartuzski Yalta”
- DPUN 0085 “Crab”
- DPUN 0104 “Hotuni Zigar”
- DPUN 0066 “Kara bala miursal”
- DPUN 0075 “Surh anor”
- DPUN 0067 “Nikitski Ranni”
- DPUN 0061 “Kaim anor”
- DPUN 0086 “Cranberry”
- DPUN 0089 “Eve”
- DPUN 0073 “Kazake”
As a P.S. to the tasting story whose heroes are Dr. Levin and Jeff Moersfelder, there’s good news for all pomegranate lovers. Dr. Levin had written a definitive botanical study, *Pomegranate*, as the U.S.S.R. was breaking up. No one had time nor interest in the manuscript. He managed to get the pages, hand-typed on onion skin paper, out of Turkmenistan with Dr. Bill Feldman of the Boyce-Thompson Arboretum in Arizona. There the book languished, not fully translated and with no funds to get the job finished. In late 2004, Richard Ashton of Oak Creek Orchard came upon the article I’d written in Orion and took upon himself the task of finding a translator to finish the project. There were delays but *Pomegranate* will be published in December of 2006 by Third Millennium Publishing, both in print and electronic edition.

The second tasting report is by David Silverstein, Chairman of the San Diego, California, chapter of the California Rare Fruit Growers

**POMEGRANATE TASTING AT CRFG, SAN DIEGO CHAPTER MEETING, OCTOBER 27TH, 2005**

*David Silverstein.*

Here are the results of our pomegranate tasting at the last meeting. It was very interesting. There were 11 fruits officially in the tasting. Nine of these are the best of 40 that I tasted in the field up at the experimental orchard near Davis, CA on 30 September. Two of them were just randomly selected because I like their names. Next time I would prepare a form to make evaluation easier. I learned a couple of general things. People care more about sweetness than hard seeds. And it is more dramatic than the numbers show. #4 had big hard seeds, but good flavor with some sweetness. # 11 had lovely soft seeds and a good tart flavor. All of #4 was eaten. A lot of #11 seeds went home for Zhenxing’s rabbit. Tastes are also quite diverse. Different people have different preferences and different sensitivities. For example, #8 Azadi, was the favorite for three people and the least favorite of one. Go figure. Some people have very low sensitivities to some or most flavors in the fruit. Some people are extra sensitive to certain flavors. I suspect that one taster’s pleasant mild astringency is unpleasant bitterness to
another. Some excellent fruits suffered for this. These fruits are good backyard fruits for people who enjoy them. But their market potential is probably mediocre.

Here is how I scored the varieties. There were 17 ratting sheets turned in. I did not include myself in the numeric ratings. I counted first place, second place, and honorable mention (very good – third or fourth ranked where indicated.) That was all I could reliably do, since most people did not rank all the fruit because it was a very difficult task. But they often stated a favorite and sometimes also a close second. If not, it was usually easy to deduce a favorite and second favorite, and a particularly well liked one or two. Where a person ranked fruit equally, all fruit tied for points got the same rating. Favorite, second favorite, and honorable mention got 3, 2 and 1 point respectively. I added up the points for cumulative scores. Below I list representative comments from the sheets. Then numeric scores. Then my comments. Take into account that I tasted these in the field and I also ate a few over a couple of days at home with my kids, so my perspective is a little different. But then again so are my tastes and flavor sensitivities. Note also that we tasted one variety, Pink Tourmaline, which was selected from a wild growing tree up the north county someplace. This one was quite good, up there with the best of the sweet pink varieties. But there was only a little of it so only a few got to taste it. Finally, I think that there is a break point in the scores at around 11. At or above it is generally well liked. Below it may be slightly problematic.


   This is a wonderful sweet/tart refreshing fruit. Like lemonade with just the right amount of sugar in it. Seeds are very soft. Score is slightly depressed by the bias away from sour. I’d grow it.

First place – 1 Second place – 2 Honorable mention – 4 = 9

Well, what can I say. It is good with soft seed, but not sufficiently distinguished from other similar ones. I did note in the field that it has pleasant nutty taste to the seeds. But I won’t grow it.


   First place – 1 Second place – 3 Honorable mention – 2 = 11

   I think this is perfectly luscious and refreshing. Whoever called the flavor sweet and delicate agrees with me. Kids love it. Pink Tourmaline is similar. Azadi is also similar, but I think the seeds are bigger. Note though that it got a higher score; though perhaps not significantly higher. Fruit are big and nice. Is reputed to be particularly pest resistant, partly due to its short mostly closed calyx.


   First place – 1 Honorable mention – 2 = 5

   This is one that we got because the name was evocative. It means “Black Rose”. We had no taste data. Fruit was small but very dark. Even the spongy tissue inside was purple. Flavor was okay. But seeds were harder than Wonderful. However they were a crunchy hard as opposed to woody/fiberous hardness in some varieties. Extra high vitamin C content, but I won’t grow it.

5. **DPUN 119 Kolobok** – *Good Sweet. Mild but Good. Orangey*


   First place — 3 Second place – 1 = 11
This is the other one with no taste data. We got it because it is named after a Russian fairy tale character who is a big round dumpling that comes to life and goes through a series of adventures similar to our story of the Gingerbread Boy. In Russian you call something relatively big and round, like a large plump baby, a “Kolobok” after the fairy tale. (What a cutey. He’s such a Kolobok.) I expected the fruit to be big. It wasn’t, but it is pretty good. Seeds are even pretty soft. If I have a complaint though, it is that the arils are small. Still, good light pink and very juicy. In fact it is said to have juice yield between 60 and 70 per cent of total fruit weight.


   First place — 3  Second place – 1  = 11

   I’m surprised it did not score higher. Could be that it loses some quality when shipped. I am presently growing it.


   First place – 3  Honorable mention – 1  = 7

   I really like this one. The individual arils are quite big. The fruits are big and nice looking. It is highly rated for taste. I think the trouble here is that the flavor is a complex mix of astringency, sweetness, sourness, bitterness etc. I think that if you are sensitive to bitter, though, it just wrecks it for you.


   First place – 3  Second place – 2 Honorable mention – 1  = 14
Azadi is my second favorite of the sweet ones, with Syunt first. This is liked a little better by the group. It too is reputed to be pest resistant. Its fruits are a bit smaller, but still nice. It seeds are a little harder and bigger. I wasn’t going to grow it, but it is probably worth growing. In addition, Azadi is a lovely word in Persian. It means something like “freedom” or “personal liberty.”


   First place – 2 Second place – 2 = 10

   It is similar to Sogdiana tipping slightly more in the direction of sweetness. If you added my opinion to the mix it would score over 11. The fruits aren’t as big and attractive as Sogdiana. Looking at the comments, it is a controversial one. I’m growing it.


   First place – 6 Second place – 2 Honorable mention – 1 = 23

   High score, and not a close call. This is interesting. It is a soft seeded one with one of those complex tastes like Sogdiana, but well balanced and with more sweetness. It also has appearance going for it. The fruit are large and attractive with light pink skin. You would expect a mild pink fruit. But inside, the arils are deep maroon/black, forming a spectacular contrast. Very refreshing.


   First place – 1 Honorable mention – 1 = 3

   It is too tart for me too. I won’t grow it. I think that these fruits all had something to recommend them. If I had to choose my own favorites, I think that I
would go with 1, 3, 6, and 10. I already have number 9 and I will keep it, as well as number 6. I will probably request wood of all of these, but Ariana.

This third taste report was a tasting done on September 30, 2005 at the USDA/ARS pomegranate orchard in the Central Valley of California.

POMEGRANATE COLLECTION AT WOLFSKILL EXPERIMENTAL ORCHARD — 9/30/2005

David Silverstein

Outstanding varieties are marked with asterisks *. We also tasted Pink Ice, Crab, and Wonderful for reference. Wonderful was not ripe yet.

1. DPUN 140 Seidi – White Arils. Sweet but insipid.
2. DPUN 141 Zelili – Small arils. Good flavor. But almost all of the fruit was rotten inside. It was hard to find any good arils.
3. DPUN 142 Anvari – Pink tinged arils, pretty. Nice sweet taste, but hard seed.
5. DPUN - Girkanskii – Soft seed, medium red arils. Somewhat sour but good.
6. DPUN 123 Saharnyi – Too tart.
7. *PI 594964 Parfianka – Still excellent fruit, and we tasted it blind. That is, first we tasted it, pronounced it a winner. Then we looked at the tag. An excellent tasting sweet/tart variety somewhat reminiscent of Wonderful because of its deep color and flavor. But it has the advantage of small soft seeds, making it much more pleasant to eat. “Parfianka” may be a corruption of Russian Perseyanka” or “Persian Woman (or Girl).”
8. DPUN 125 Ariana – Very soft seed. Tart, but good.
10. DPUN 127 Kemine – No notes.
11. DPUN 101 Kukchirinski – Tiny elongated fruit. Solid tissue inside with a few seeds in it. An oddity. Trees also had already lost their foliage. Someone remarked at first that someone had sprayed Roundup too close. A curiosity.
13. DPUN 130 Messarian – Good flavor. Soft seed
16. DPUN 133 Hvalynskii – Arils pretty, white with pink tinge. Hard seed.
20. DPUN 137 Andalib – Tartest thus far. Lemonade.
21. DPUN 139 Myagkosemyannyi Rozovyi – Pink/white aril. Semi sour.
23. DPUN 71 Afganski – Tart. High seed material to pulp in each aril.
24. DPUN 113 Pamyati Rozanov – Good. Slightly tart. Seed soft, but bigger than average.
25. DPUN 115 32/30 name missing Cherry color arils. Slightly tart. Refreshing. Large Arils. Multiple stages of fruit hanging, including blossoms.
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28. DPUN 110 Podarok – Good tart flavor, but very hard seed. Name means gift. The gift here is the plant is very fruitful.
32. DPUN 106 Gissarki Alyi – Like Rozovyi, but more (too) sour.
33. DPUN 105 Agat – Very soft seed, but too sour (was it ripe)
34. PI 599115 Green Globe – Fruit size not exceptional. Some already split. Flavor average with hard seed.
35. PI 599113 Eversweet – Mine here in San Diego was finished in late august. But bore only one fruit this year. Last year was pretty good though. I wonder if it is an alternate bearer. This tree still had lots of fruit. Flavor was very good. Seed medium soft (substantially softer than wonderful.)
37. PI 599578 Hoku Botan – White flower ornamental. No pigment in outer skin of fruit or in arils. Very sour.
38. *DPUN 82 Pink Ice (Sin Pepe) – Excellent very soft seeded, medium sized, attractive pink fruit with pink arils and a sweet fruity taste. It was a favorite in our taste test here in San Diego. Has favorable mention in CRFG publication going back to at least 1988. Tree seems productive.
39. DPUN 83 (No Name) – Similar to Pink Ice but slightly harder seed, slightly less sweet. Fruit greenish-yellow with pink blush. Arils smaller pink.

We have left these comments as they were made so you could see the bare facts even though they do not abide by the rules of English. We believe that you
will get the true taste of what people meant when they made their comments this way. You be the judge.

As you will notice by all the short comments about each fruit, two people will not have the same feeling of the same fruit. It just proves as we all know everybody’s tastes are not the same. Some like the sweet-tart fruit and a lot of people like the sweet fruit but still there are some subtle differences in people liking the same taste group of fruit. So if you want a particular taste, select your variety with care.

Most of the American varieties were not involved in these taste tests as there is already good information of their tastes – see Variety Chapter. These are mostly Central Asian varieties being tasted because up until now we had no taste data on these varieties other than a few general statements about a few of them.
CHAPTER X: THE POMEGRANATE

Mrs. LaBerta W. Bowler

Mrs. LaBerta W. Bowler wrote *The Pomegranate* over 30 years ago and the words are as current today as they were then. Mrs. Bowler is believed to be responsible for bringing the variety we now call Utah Sweet to the attention of the public, by distributing cuttings. She refers to the variety as ‘pink sweets.’ Someone else gave Utah Sweet the name it now bears now but it all started as a local variety. We are pleased to reprint her fine descriptions and careful observations in their entirety.

First published by *North American Fruit Explorers* in their publication *Pomona*, Volume 8, Number 1, January 1975.

The Pomegranate

Mrs. LaBerta W. Bowler

I would probably be an apartment dweller rather than a dirt farmer if I did not have three compulsive reasons for digging in the dirt:

1. I like watching things grow. 2. I like creating beauty 3. I love eating the food I produce.

In my area of Southwestern desert the soil and the extreme temperature range limit the number of plants that will grow, and finding one that fill all three of my requirements is difficult.

Heading the list would be the pomegranate. It grows exuberantly. It can be held as an informal hedge by severe pruning and will still set a few fruits. Given lots of room it grows into a mammoth bush arching gracefully to the ground. My favorite way to grow it is as a 15-25 foot multi-trunked tree.
Plant and Fruit

It grows gnarled and twisted with a soft, grey, rough bark which contrasts beautifully with the ever-changing leaves. In spring it literally bursts into red-bronze leaf—a breath-taking sight, glistening in the early morning sun. The bronze changes to a brightly polished green which remains lush even in the hottest driest weather.

The change to bright butter yellow in the fall is spectacular. As they fall, the small leaves easily lose themselves without making any mess.

The blossoms, depending on variety, range from crepe-like soft coral to a vibrant red-orange. If one also includes ornamental varieties, the range is greater.

The commercial variety, Wonderful, is superior in size of flower and fruit and also has richer green leaves. The fruits make excellent jellies, jams and juice, either mixed with other fruits or solo.

We grow a seemingly local variety which is smaller & sweeter and only faintly pink which, I am told, came originally from Egypt, brought to Utah’s “Dixie” and to Southern Nevada by Mormon missionaries. Until recently it has been pretty well localized, but I have sent cuttings and seedlings to many areas and understand that there is now a commercial planting in California. I did see them for sale in a market in Nogales, Mexico, also.

The edible seeds of this variety are tender, pale pink, very sweet. The entire plant—foliage, flower & fruit—is paler colored and smaller than Wonderful. The flavor is not only milder but completely non-acid; the seeds are soft, making it much more acceptable for most palates.

The pink sweets are delightful for several uses: Eating out of hand; pureed, strained and sweetened slightly if necessary for topping ice cream or custard; filling the hollows in pineapple or pear halves; added to yogurt or jello. My favorite is mixed fruit salad traditional here in Utah’s “Dixie” as a part of the Thanksgiving feast. It contains (variously) apples, pears, seedless grapes, raisins, nut meats, pineapple, orange or tangerine sections, the pomegranate seeds, all
The Incredible Pomegranate

blended together with whipped cream sweetened and flavored with a little vanilla.

Pomegranates will survive zero degrees, alkaline soil, poor soil (either sandy, rocky, or clay), much water or almost drought conditions and neglect. With good soil and a little care they are beautifully ornamental and bountiful. They do require summer heat and a long growing season.

The pink sweets have a tendency to crack open as they ripen. Both varieties store easily just in an open box in an unheated room. The pink sweets begin to soften and spoil by the end of February, but the sour “Wonderful” will last another five weeks. If either variety begins to soften, they can be cracked open and fed to birds and chickens. They are as fond of them as I am.

The pomegranate begins flowering in last April or early May and has continuous scattered blooms throughout the summer. The fruit becomes usable by mid-October, but is best if left on the tree until mid-November when nights are chilly and days still warm.

When we pick, we leave most of the cracked fruit for the huge flocks of birds who fly in, en route the South, I’ve always believed, because of the flock size and species. They chatter & twitter excitedly as they empty the leather-like rinds and leave them hanging for the winter wind to rustle.

Incidentally, the rinds make a self-mordanting dye of a beautiful green with a yellowish cast.

I enjoy the picturesque winter form of pomegranate’s bare branches against a stormy sky, when they look silvery grey; or a darker look against the golden dry grass.

Pomegranate branches with blossoms or young fruit make long lasting indoor floral arrangements, and they are delightful as bonsai.

A most versatile shrub-tree—easy to grow, beautiful in all seasons, highly productive of real gourmet eating for us and the birds – it feeds the body and the soul.
CHAPTER XI : TESTING - BYRON, GEORGIA

Richard Ashton

This is an old recommendation of USDA/ARS, Southeastern Fruit and Tree Nut Research Lab in Byron, Georgia. In 1976 this research station received 28 pomegranate varieties (clones), 19 from Russia and 9 from Iran. This recommendation was written in 1988 in relation to what the researchers considered the best varieties of the 28, for growing conditions in middle Georgia.

Pomegranates, Punica granatum, from Russia 5-11-76

- R-2 Mejhos 6269 R-19 Nikitski ranni
- R-5 Sakerdze R-20 Zebejda (Denau)
- R-6 Al-sirin-nar R-24 Kunduzski
- R-7 Kaim-anor R-25 Bala Miursal
- R-8 Salavatski R-26 Afganski
- R-9 Kaj-acik-anor R-29 Apseronski
- R-11 Sejanec 2-5/8 R-30 Kazake
- R-12 Apseronski karsnyj R-31 Saartuzski (Yalta)
- R-14 Krmyzy-kabuh (Denau) R-33 Surh-anor
- R-16 Kara bala miursal

Pomegranates from Iran 2-28-76

- I-2 Alk Pust Ghermez Saveh
- I-5 Shirin yazd (sweet yazd)
Plant and Fruit

- I-6 Tabestani malas Biranden saveh (summer ? from Saveh)
- I-7 Dorosht 5 hahanshahi Khoramabad (Big fruited from Khoramabad)
- I-8 Entek habi saveh (From saveh)
- I-9 Shirin pust siah (sweet peel from siah)
- I-10 Mahali Dezful (Dezful local)
- I-11 Shirin Pust Ghermez Saveh (Sweet red peel from Saveh)
- I-12 Shirin Kuhy Ardakan (sweet mountain from Ardakan)

Pomegranate Clones Best Adapted to Middle Georgia

All clones listed below are vigorous growers and at least 1 plant in 4 has fruit in 1988

<table>
<thead>
<tr>
<th>Clone Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-8</td>
<td>Entek habi Saveh</td>
</tr>
<tr>
<td>R-2</td>
<td>Mejhos 6269</td>
</tr>
<tr>
<td>* R-8</td>
<td>Salavatski</td>
</tr>
<tr>
<td>* R-9</td>
<td>Kaj-acik-anor</td>
</tr>
<tr>
<td>R-29</td>
<td>Apseronski</td>
</tr>
<tr>
<td>R-11</td>
<td>Sejanec 2-5/8</td>
</tr>
<tr>
<td>R-12</td>
<td>Apseronski krasnyj</td>
</tr>
<tr>
<td>* R-26</td>
<td>Afganski</td>
</tr>
<tr>
<td>* R-31</td>
<td>Saartuzski (yalta)</td>
</tr>
<tr>
<td>* R-33</td>
<td>Surh-anor</td>
</tr>
</tbody>
</table>

*All living plants have fruit in 1988.

Notes:

- R-2, R-8, R-19, R-29 and R-33 had scattered fruit in 1984.
- In 1985 a severe drop to -6 degrees F killed almost all plants to the ground level.
- In 1986 R-8, R-12 and R-33 had scattered fruit.
- 1986 and 1987 were outstanding drought years. These pomegranates are no longer irrigated.
The Incredible Pomegranate

All but R-14, I-5 and I-6 have one to many fruit in 1988. Plants are being trained to 3-5 trunks.

The above reports were made available by the kind help of:
Michael W. Hotchkiss
USDA/ARS
Southeastern Fruit and Tree Nut Research Lab
Byron, Georgia

Since these reports were made, I have been cautioned that the severe freeze in 1985 of -6 degrees F did not last very long and should not be considered the end-all of selecting cold-hardy varieties. Other conditions were in play such as moisture and other horticultural variables.

The best clones (varieties) for middle Georgia as noted here are not the only varieties that might be adaptable there. Since I believe that this is important information, I have included it here for your consideration.
AUTHORS

Richard W. Ashton

Richard has been testing Central Asian and other pomegranates at his Oak Creek Orchard in Texas. He is Chairman of the Pomegranate Group of the North American Fruit Explorers.

Barbara L. Baer

Barbara is the owner of Floreant Press, a Northern California publishing house. She went to Turkmenistan in search of pomegranates and Dr. Levin. The rest is history.

David E. Silverstein

David is pomegranate consultant for the California Rare Fruit Growers and is Chairman of the San Diego, California Chapter of CRFG.
CONTACTS

This section is for contacts for suppliers and organizations that are helpful to fruit growing, including pomegranates.

ORGANIZATIONS:

California Rare Fruit Growers
www.crfg.org
Membership: $30.00 /year
California Rare Fruit Growers, Inc.
Fullerton Arboretum – CSUF
P.O. Box 6850
Fullerton, CA 92834-6850

North American Fruit Explorers
www.nafex.org
Membership: $13.00 /year
NAFEX
1716 Apples Rd.
Chapin, IL 62628 or call 217-245-7589

Southern Fruit Fellowship
Go to www.nafex.org and click on the regional groups.
Membership: $10.00 /year
Southern Fruit Fellowship
Retta Davis
2051 Evergreen Drive
Shreveport, LA 71118 or contact Retta at davisd_r@hotmail.com
NURSERY SUPPLIES:

Supplies for propagation of pomegranates are included here.
Home Harvest ® Garden Supply
4870 Dawn Avenue
East Lansing, Michigan 48823
517-332-5016
Website: http://homeharvest.com

This supply company has both ‘Physan 20’ and Dip ‘N Grow. Which are beneficial in rooting pomegranate cuttings.

A.M. Leonard
241 Fox Drive
Piqua, Ohio 45356-0816
800-543-8955
Website: www.amleo.com

This supply company has all types of outdoor gardening and greenhouse supplies.

77 Hydro
37 Fairfield Place
West Caldwell, NJ 07006
877-774-9376
Website: http://store.yahoo.com/77 hydro-store/index.html

Has indoor gardening and greenhouse supplies. Has Physan 20 and Dip ‘N Grow.
APPENDIX:

THE INCREDIBLE POMEGRANATE IN PICTURES
PUNICA GRANATUM L.

from *Flora of Germany Österreich und der Schweiz*,
by Professor Dr. Otto Wilhelm Thome, 1885
The Incredible Pomegranate
KARA BALA MIURSAL

Tree and Fruit
by Marilyn Cannon
The Incredible Pomegranate

A-5
PARFIANKA

Tree by Marilyn Cannon,
Fruit by Jeff Moersfelder
The Incredible Pomegranate
NIKITSKI RANNI

Tree and Fruit
by Marilyn Cannon
The Incredible Pomegranate

A-9
Plant and Fruit

SVERKHRANNIY

Tree and Fruit
by Marilyn Cannon
Plant and Fruit

Top Left: AL-SIRIN-NAR
Top Right: DORSHT 5
Middle Left: ENTEK HABI SAVEH
Middle Right: FLEISHMAN
Bottom Left: HOTUNI ZIGAR
Bottom Right: SALAVATSKI

All photographs by Marilyn Cannon
The Incredible Pomegranate
Plant and Fruit

Top  HAKU-BOTAN
Middle  KI ZAKURO
Bottom  DOUBLE RED #2

All photographs by Jeff Moersfelder
The Incredible Pomegranate