

Perplexing sweet-tart fruit Kumquats Don't Get Much Respect

Story and images by David Karp

Growing up in Los Angeles in the 1960s, my brother and I knew just what to do with kumquats from the potted tree on the patio: we tossed them at each other. In the manner of most Californians, we never ate them.

(turn to page 12)

Centennial variegated kumquat hybrid, Lindcove Research and Extension Center (REC)

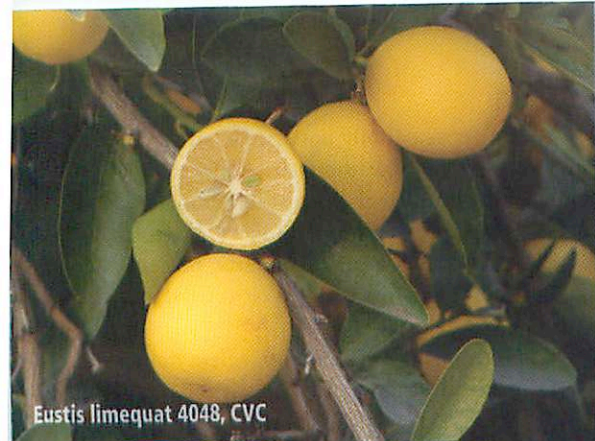
Nordmann kumquat, Citrus Variety Collection (CVC)

Marumi kumquat 4125, CVC

Rio Grande Valley lemonquat, CVC

Meiwa kumquat, Binchuan, China

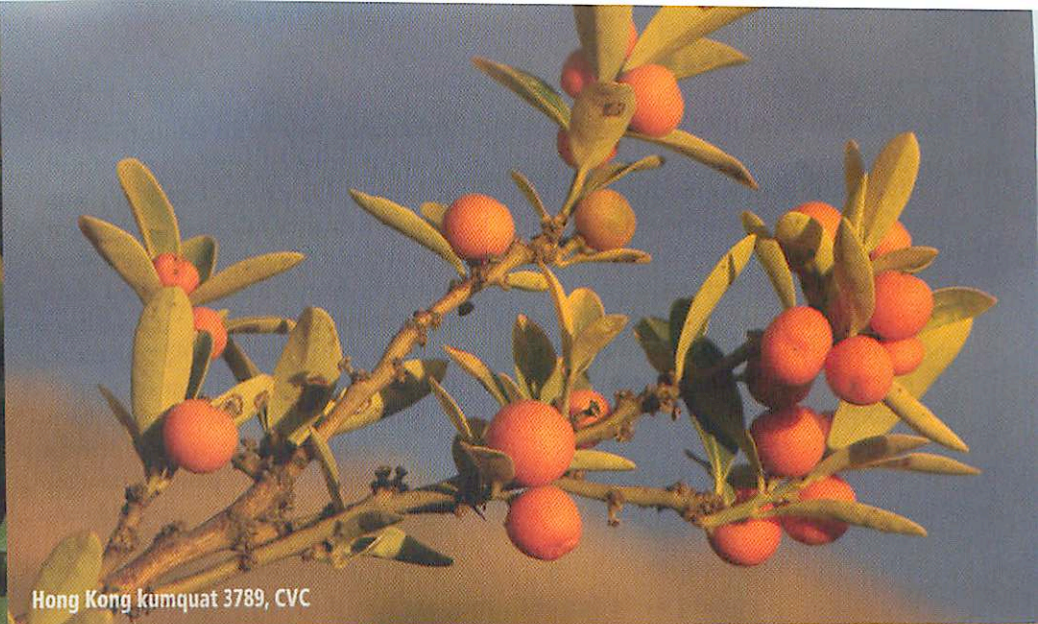
Kumquat hybrid 1044, CVC



Eustis limequat 4048, CVC



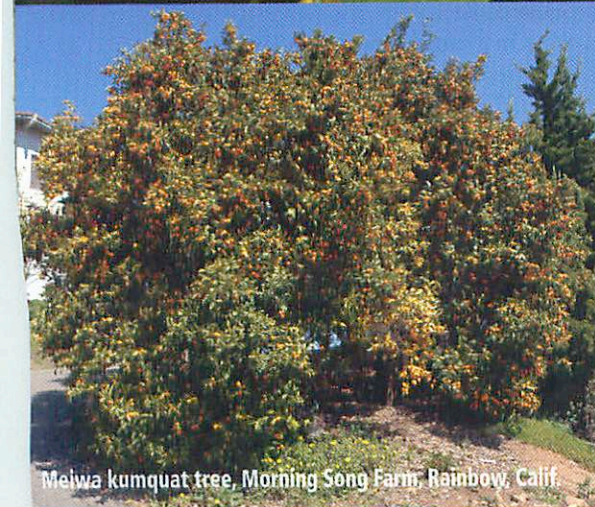
Tavares limequat 4048, CVC



Hong Kong kumquat 3789, CVC



Nagami, Beck grove, Fallbrook, Calif.



Meiwa kumquat tree, Morning Song Farm, Rainbow, Calif.



Nagami, Beck grove, Fallbrook, Calif.

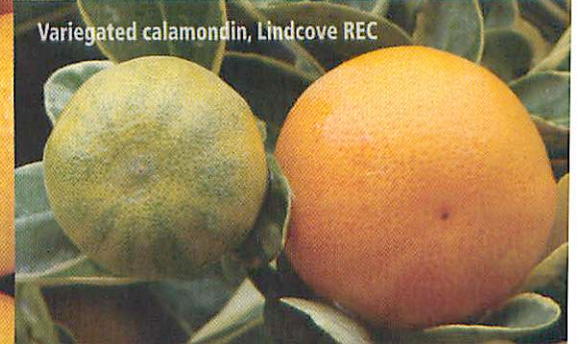
Are Kumquats Citrus?

Many sources state that kumquats are not citrus fruits, but the truth, like kumquats' flavor, is complex. In most ways kumquats closely resemble citrus, and they were classified together after the Scottish botanist Robert Fortune brought the first kumquat plant to London in 1846. In 1915, however, the great citrus scientist Walter T. Swingle established a new genus, *Fortunella*, for kumquats, based on structural differences in the flowers, oil glands, leaves and fruits of kumquats compared to those of other citrus.

Molecular sequence analyses, which in theory could settle the question, have differed in their conclusions, depending on the methods used. A British botanist, David J. Mabberley, proposed reuniting kumquats taxonomically with citrus in 1998, but Swingle's system is still more generally accepted, at least partly because scientists don't want the inconvenience and confusion of changing names.

"I don't believe that there's overwhelming evidence on one side or the other at the moment," said Mikeal L. Roose, professor of citrus genetics at the University of California at Riverside. "There's science involved in accumulating a body of evidence, but how you evaluate that evidence in deciding what should be different genera, and what should be different species within a genus, is not as far as I can see a scientific argument. In the worst case scenario, all you're talking about is a continuum of variation, as things move further and further apart, as their last common ancestor is longer and longer ago they get more and more different; but the question is when the degree of divergence becomes sufficient to justify calling them separate genera. There's not a clear rule in my mind as to how you make that decision."

"I view all of taxonomy as a human endeavor to artificially categorize that which has evolved naturally and in many different ways, shapes and forms," said Dr. Fred G. Gmitter, Jr., professor of citrus genetics at the University of Florida at Lake Alfred. "To me the only important thing is that we have a common name to speak about things."



Variegated calamondin, Lindcove REC

Since then, without much fanfare, cultivation of kumquats for food has grown considerably in Southern California, which now leads the nation in production. It's still a minor crop compared to other citrus, but both chefs and consumers are giving kumquats more respect, and specialty growers are planting intriguing, previously rare varieties.

The standard variety, the oval-shaped Nagami, does present a challenge for the

uninitiated, at least for eating fresh. In most citrus the juicy pulp is consumed, and the peel discarded. Contrarily, kumquats are eaten whole, and the Nagami's appeal stems from the contrast between its tart flesh and thick, sweet rind. Some aficionados rub the skin to release its pungent oil, or cut the fruit and squeeze out the sour juice before eating.

Kumquats are intense, complex flavor-bombs. Trained sensory analysts detect a fresh, citrusy odor and pungent taste to begin, followed by green and woody notes,

with a persistent oily undertone, and a sweet, apricot-like aftertaste. A few years ago a Korean flavor chemist determined that the component that imparts the fruit's distinctive spicy aroma is an ester, present in minute quantities, called citronellyl acetate (Choi, 2005).

North San Diego County, where many farms focus on specialty crops, is the top production area, with 71 acres of kumquats, mostly in small plantings. The local season starts in January and runs through June, but kumquats are at their best, fully ripe yet still firm, from February through April.

The fruit's biggest booster may be Helene Beck of Fallbrook, aka "Miss Kumquat," who grows several hundred of the trees with her husband, Robert. She sells Nagamis wholesale and online, along with kumquat syrup, puree, conserves and fruit leather, and is working on a book of recipes.

"Even here in Fallbrook, many people still don't know what to do with them," she said, offering a plate of freshly baked kumquat cookies.

On a sunny morning in late January, the view from her Tuscan-style hilltop villa, flanked by cypress trees, evoked an old-world vineyard and chateau. Below in the kumquat orchard, the lush green trees sparkled with bright orange fruit, which two workers painstakingly clipped into canvas sacks.

Chefs prize kumquats' pungency, chewy texture and sheer beauty. Breanne Varela, pastry chef at Lucques and AOC in Los Angeles, serves a dessert of yogurt panna cotta served with candied kumquats, Cocktail grapefruit and blood oranges. Zoe Nathan at Rustic Canyon combines kumquats with crème fraîche for an ice cream that she serves by itself or with cornmeal pound cake.

Origin in Asia

Kumquats are native to China, where they are eaten fresh, made into preserves, used for religious offerings, and grown as ornamental plants. They reached Europe long after other citrus, in 1846, and arrived in California about 1880.

For many years kumquats were grown in Florida primarily for the gift-package trade, and in California almost exclusively as ornamental plants. The 1950 Census listed 180 acres of kumquats in Florida, just one in California. But starting in the late 1960s, increased Asian immigration to California

Leading Varieties of Kumquats and their Hybrids

KUMQUATS

Hong Kong, or Golden Bean kumquat (*Fortunella hindsii*). The most primitive kumquat type, and the only one found growing wild, in southern China. The smallest citrus fruit, grown primarily as an ornamental. Fruit pea-sized, round; rind bright red-orange, thin; pulp very scanty, bitter and acid; two to four seeds fill the fruit. Rare in the United States, not grown commercially here.

Marumi, or round kumquat (*F. japonica*). Ancient Chinese kumquat type, called *Luowen* in China. Fruit small, round to slightly oval; rind thick, smooth, orange to yellow-orange, with prominent oil glands, intermediate between Nagami and Meiwa in sweetness; pulp can be dry or fairly juicy; one to six seeds. Commercially grown in very small quantities, prospects limited by high harvest costs.

Meiwa, or large round kumquat (*F. x crassifolia*). Jindan or Jingan in China, Neiba in Japan. Natural hybrid of Nagami and Marumi. Best kumquat for eating fresh, popular in Asia. Fruit large, slightly oval to round; rind smooth, orange, very thick and sweet; juice scanty; two to five seeds. Brought to Japan from China during the Meiwa period (1764–72), hence its name; imported to the United States 1910–12, but only recently grown commercially, on a modest scale, in California and Florida.

Nagami, or oval kumquat (*F. margarita*). Ancient Chinese kumquat type, known as *Luofu* in China. Brought to the United States in 1850, and to California in 1880. Medium size; oval shape; rind thick, smooth, bright orange, sweet; pulp tart, fairly juicy; flavor spicy, intense, sweet-tart; two to five seeds. The standard commercial kumquat, 90% of the crop in both California and Florida.

Nordmann Seedless kumquat (*F. margarita*). Discovered on a Nagami seedling by George Otto Nordmann in 1965 in DeLand, Fla. Similar to Nagami, with a slightly different shape, lighter skin and no seeds. Medium size; teardrop shape, tapered toward stem end; rind thick, yellow-orange, sweet; pulp tart, fairly juicy; flavor like Nagami; seedless. Commercially grown in very small quantities in California.

KUMQUAT HYBRIDS

Calamondin, or calamansi. Hybrid of kumquat and sour mandarin, or perhaps a backcross from such a hybrid to mandarin. Originated in southern China, but best known as the leading citrus fruit of the Philippines; also grown in other countries in Eastern Asia; juice used for souring, as for lime and lemon; also grown as a potted ornamental. Fruit small, round; rind smooth, deep orange, peelable when mature, edible, with kumquat flavor; pulp very tart, juicy. Recently grown commercially in California.

Centennial variegated kumquat hybrid. Variegated mutation found on a twig of a breeding selection, a Nagami hybrid, in 1986

in Florida; grown primarily as an ornamental. Tree very attractive; fruit larger than a typical kumquat; round to oval, necked; foliage variegated gray-green, pale yellow and dark green; rind thin, sweet, striped green and yellow when young, pinkish orange against yellow-orange when mature; pulp orange, fairly acid, juicy; seedy. Trees available from nurseries.

Eustis limequat. Hybrid of West Indian lime and Marumi kumquat made in 1909 by Walter T. Swingle, intended as a more coldhardy lime-like fruit. Fruit larger than a kumquat, oval to round; rind very smooth, thin, light yellow, sweet and edible; pulp light green to yellow, juicy, very acid, with lime flavor; fairly seedy. Commercially grown in small quantities. Also popular as an ornamental tree.

Fukushu, or Changshou kumquat hybrid (*F. x obovata*). Hybrid of kumquat and mandarin, commonly grown as a potted plant in China, and for candying fruits. Fruit large for a kumquat, slightly flattened to round; rind smooth, orange, relatively thin, sweet and edible, often peelable; pulp tart and juicy; seediness variable. Recently has been grown commercially on a modest scale in California.

Indio mandarinquat. Hybrid of Nagami kumquat and Dancy mandarin, made at UCLA before 1972, selected in Indio. Too tart to eat fresh, but good for marmalade, and as an ornamental. Fruit larger than a kumquat, teardrop shaped, with a distinct neck; rind bright orange, rough, thin, edible but not sweet; pulp tender, juicy, tart; three to 10 seeds. Grown commercially on a small scale in California.

Rio Grande Valley lemonquat. Discovered in Beeville, Texas, chance hybrid of a kumquat and either a Meyer lemon or a mandarin such as Dancy or clementine (which would make it a mandarinquat). Fruits large, round; rind smooth, bright orange-yellow, sweet and edible; pulp orange-yellow, tender, very juicy, moderately tart, pleasant. Backyard favorite in Texas, trees not yet available in California.

Tavares limequat. Hybrid of West Indian lime and Nagami kumquat made in 1909 by Swingle, intended as a more coldhardy lime-like fruit. Fruit small, oblong, more elongated than Eustis, narrower at the stem end; rind very smooth, thin, yellow to orange-yellow, sweet and edible; pulp light green to yellow, juicy, very acid, with lime flavor; fairly seedy. Hardly grown at all in California.

Variegated calamondin. Natural mutation of calamondin, originated with Paul Peters in Altadena, circa 1954. Attractive ornamental tree, foliage variegated dark green, light green, yellow. Fruit smaller, lighter in color when mature than calamondin, variegated, only when immature, green and yellow. Grown on a small scale by California specialty citrus farmers, to ship ornamental branches.

spurred demand and prices for kumquats.

"The market was so hot for Nagamis in the 80s, we used to send crews to harvest home garden trees," recalled Lloyd Bittner, manager of the Cal Flavor packing house in Escondido, which was at the center of the boom.

Eventually supply exceeded demand, said Bittner. "People would call up to ask, 'hey, are you coming to pick my kumquats this year?' But we had all that we could sell."

Today California has 133 acres of kumquats, and Florida 46, mostly near Dade City, northeast of Tampa. Shippers estimate that 80 percent of the crop goes to Asian-Americans, and 90 percent is Nagami.

In the last decade, however, the roundish Meiwa variety, the best for eating fresh, has become more available. Introduced from Japan about 1910, later than Nagami, it is larger, and has thicker, sweeter skin, and less sour juice; when fully ripe it can have a wonderful tropical banana flavor. Long popular in home gardens, it was not much planted commercially because the tree is a slower, less vigorous grower, incompatible with some common rootstocks, and the fruits have a shorter shelf life.

These drawbacks sound daunting, but in De Luz, a gorgeous, pristine area of chaparral, citrus and avocado groves north of Fallbrook, two growers, Juan Garcia and George Cunningham, have thrived planting Meiwas. "I sell 10-pound boxes of Nagami for \$22, but Meiwa for \$31," said Cunningham in his packing shed. "Meiwas just fly out of here."

Normally other farmers would jump on this lucrative opportunity, but citrus growers in San Diego County recently have suffered such catastrophic ordeals – fires, irrigation water cutbacks, and the threat of deadly greening disease – that few are planting new citrus these days.

In the Southeastern San Joaquin Valley, the state's largest commercial citrus district, kumquats are rare, but several niche growers offer exotic kumquats and hybrids. The most potentially significant, although planted in only small quantities so far, is the Nordmann Seedless, discovered on a Nagami seedling in Florida in 1965 (Loeblich, 1994a). With a teardrop shape and a slightly thinner, paler skin (probably caused by the absence of plant hormones from the seeds), it looks slightly different from Nagami, but has much the same flavor. Its primary appeal is seedlessness.

Kumquats typically have two to five seeds, which some people swallow, but most spit out; removing them for cooking is tedious. D.J. Olsen, chef of Lou in Hollywood, which serves sliced candied kumquat with burrata, speck, and vincotto, said his kitchen help groans when he brings in a box of kumquats for deseeding. "They say, 'I did it last time, so it's your turn,'" he said. "I'd love it if someone had seedless kumquats."

Other seedless varieties exist in Texas and Asia, and it seems likely that in time they will become common.

Spring warmth in the San Joaquin Valley causes most citrus to mature several weeks earlier than in the Southland, but kumquats, which flower very late, in summer, ripen peculiarly in the Central Valley, as late as March in some locations.

In order to supply the market for Chinese New Year, which can fall from late January to mid-February, several growers have planted Fukushu, which is large, round, and juicy, and matures around Christmas. It is sold as a kumquat, but is actually a hybrid with mandarin.

"Asians love them, and marmalade companies get into bidding wars for them," said Mike Foskett of California Citrus Specialties, who has 300 Fukushu trees.

The Calamondin

Another kumquat-mandarin hybrid starting to be grown commercially is the calamondin, the national citrus fruit of the Philippines, where the juice is used for souring like limes or lemons. Filipino immigrants to California have long grown the attractive trees in their *(continues next page)*

On the Trail of Kumquats

Recommended sources for kumquats and kumquat hybrids. For times and locations of farmers markets, see the *Los Angeles Times* farmers market list.

Atkins Nursery (Victor Gonzalez). Kumquat trees available at wholesale and retail. 3129 Reche Road, Fallbrook, CA 92028; (760) 728-1610; atkinsnursery@aol.com.

Beck Grove / La Vigne Organics (Helene and Robert Beck), *Fallbrook, Calif.* Organic and biodynamic Nagami kumquats, kumquat syrup, puree, preserves and fruit leather. (760) 723-9997; www.lavignefoods.com.

Betty B's Ranch (George and Betty Schnurer), *Ramona, Calif.* Nagami kumquats, calamondins, Eustis limequats and Indio mandarinquats. At Santa Monica (Wed.) farmers market every other week.

Cal Flavor Inc. (Lloyd Bittner, manager of packaginghouse; Neil Witt, owner, sales). Packinghouse with particular expertise in kumquats. 440 N. Andreasen Dr., Escondido, CA 92029; (760) 741-2656.

California Citrus Specialties (Mike and Barbara Foskett, Lance and Laura Walheim), *Springville and Exeter, Calif.* Nordmann Seedless, Meiwa and Fukushu kumquats, Indio mandarinquats and variegated calamondins. Wholesale. (559) 539-3482; www.calcitruspecialties.com.

Citrus Variety Collection. Information about and photos of kumquat varieties. Go to www.citrusvariety.ucr.edu/citrus/kumquats.html.

Clausen Nursery. Nagami, Meiwa and limequat trees in 5-, 7-, and 15-gallon containers. 3132 Blackwell Drive, Vista, CA 92084; (760) 724-3143.

Coyote Growers (Jim and Jeanne Davis). Nagami kumquats, grown in *De Luz, Calif.* At Hollywood (Sun.), Beverly Hills, Torrance (Sat.), and Irvine (Sat.) farmers markets.

Cunningham Organic Farm (George and Gale Cunningham), *De Luz, Calif.* Organic Meiwa and Nagami. At Temecula (Sat.) farmers market, and wholesale. (760) 728-7343.

Deer Creek Heights Ranch (Lisle and Mary Lou Babcock), *Terra Bella, Calif.* Organic Nagami, Meiwa, Marumi, and Fukushu kumquats, Eustis limequats and Indio mandarinquats. Wholesale. (559) 788-7074; www.deercreeheightsranch.com.

Four Winds Growers (Don Dillon Jr.). Nagami, Meiwa, Centennial

Variegated, Nordmann Seedless, Fukushu and Marumi kumquat trees, Eustis limequat, Nippon orangequat and Indio mandarinquat trees. (510) 656-2591; www.fourwindsgrowers.com. Also available at Orchard Supply Hardware stores in Southern California.

Garcia Organic Farm (Juan Garcia; Armando and Leticia Garcia), *De Luz, Calif.* Organic Meiwa. At Santa Monica farmers markets (Wed., Sat. Organic, Sun.).

Kumquat Growers, Inc. (Greg and Fanchone Gude). Grower-packer-shippers of kumquats, dominates *Florida* production. Season November 15th–March 15. 13th annual Kumquat Festival will be held in Dade City on January 30, 2009. 31647 Gude Road, Dade City, FL 33525; (352) 588-0289; www.kumquatgrowers.com; www.kumquatfestival.org.

Mud Creek Ranch (Steve and Robin Smith), *Santa Paula, Calif.* Organic Nordmann Seedless, Nagami, Meiwa, Marumi and Fukushu kumquats, Eustis limequats, Indio mandarinquats, calamondins and variegated calamondins (young trees, small quantities for many varieties). At Hollywood (Sun.), Ojai and Santa Monica (Wed.) farmers markets.

Rios Vista Ranch (formerly Nora Rios; now owned by Ron and Catherine Sahu), *Fallbrook, Calif.* Nagami. At the Alhambra, Torrance (Tuesday and Saturday), and Santa Monica (Saturday Pico) farmers markets.

Rising C Ranches (Eric and Kim Christensen), *Orange Cove, Calif.* Nordmann Seedless, Nagami, Meiwa and Fukushu kumquats, Eustis limequats, Indio mandarinquats and calamondins. Wholesale and mail order. (559) 626-7917; www.ripetoyou.com.

Schaner, Peter and Kayne, *Valley Center, Calif.* Nagami. At Santa Monica (Wed.) farmers market.

TreeSource Citrus Nursery (Roger Smith). Large wholesale citrus nursery, sells trees of Nagami, Meiwa, Nordmann, Centennial Variegated, Variegated calamondin, Indio mandarinquat, Eustis limequat, Tavares limequat. 504 North Kaweah Ave., Exeter, CA 93221; (559) 592-2304; www.citrusreesource.com.

Thys Ranch (Myra and Carol Thys), *Fallbrook, Calif.* Organic Nagami. At Torrance (Tues. and Sat.) farmers markets.

QUARANTINE EXPANDS FOR ASIAN CITRUS PSYLLID

New portions of four counties recently added

SACRAMENTO, NOV. 24, 2009—Recent detections of the Asian citrus psyllid in Imperial, San Diego and Los Angeles counties have resulted in the expansion of quarantines. Because the finds occurred close to county lines, there also are implications for Riverside and San Bernardino counties.

The Asian citrus psyllid quarantine has expanded into Riverside County because of three distinct adjoining areas: a roughly five-mile-long arc due north of Valley Center, in San Diego County, where a psyllid was recently detected; all of the Coachella Valley, following a detection in the northwestern corner of Imperial County; and the northwestern corner of Riverside County, following a detection in Pomona, which is in Los Angeles County.

The Pomona detection also resulted in portions of west San Bernardino County being placed under quarantine. The Valley Center detection also resulted in an additional 977 square miles of San Diego County under quarantine.

Maps of the areas mentioned may be found at: http://www.cdfa.ca.gov/phpps/PE/InteriorExclusion/acp_quarantine.html

The Asian citrus psyllid can carry the disease *huanglongbing*, or HLB, also known as "citrus greening disease." All citrus and closely related plant species are susceptible host plants for both the Asian citrus psyllid and HLB. There is no cure for HLB once a citrus tree becomes infected. The diseased tree will produce inedible fruit and decline in health until it dies. California remains free of HLB.

Agricultural shipments from the quarantine zones are restricted by regulations designed to minimize movement of potentially infested commodities. Residents and people moving through the quarantine zone are urged not to remove citrus fruits with leaves and stems from the area. The quarantine prohibits the movement of citrus nursery stock and other ACP host plants, such as Orange Jasmine, out of the quarantine area.


A total of 14,201 square miles, or 8.5 percent, of California's total land mass—an area larger than the state of Maryland—is now under quarantine for Asian citrus psyllid in California.

Readers are strongly advised that their caution should extend to all plants from the Rutaceae or Rue family. —Editor

RESPECTING KUMQUATS (from page 13)

gardens, and sold a few fruits at farmers markets, but not in substantial quantities.

Brigitte and Angelito Uson, taking the cake for creative siting, planted 175 calamondin trees to beautify a bare corner of the lot around their funeral home, Vaca Hills Chapel, in Vacaville, southwest of Sacramento. They did so well selling the fruit to Filipino stores in the San Francisco Bay Area that they planted nearly 4,000 trees on 10 acres in nearby Fairfield. Filipinos

squeeze fresh calamondin juice into marinades for barbecue meats, and add it to soy sauce to dress noodles, while the rind, which has a kumquat aroma, is used to flavor custards, said Mr. Uson. 

David Karp is a writer and photographer based in Los Angeles, specializing in fruit, and particularly in citrus. He is an associate in the Agricultural Experiment Station at the University of California at Riverside, and works with the Citrus Variety Collection to document its 1,000+ accessions. A previous version of this article appeared in the Los Angeles Times on February 25, 2009. David writes a weekly column about produce at farmers markets, which appears online at <http://www.latimes.com/features/food>.

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