

FRUIT GARDENER

California Rare Fruit Growers



Color pictorial of the
2009 Festival of Fruit
Santa Rosa celebration page 16

ONE STEP SHORT OF PARADISE

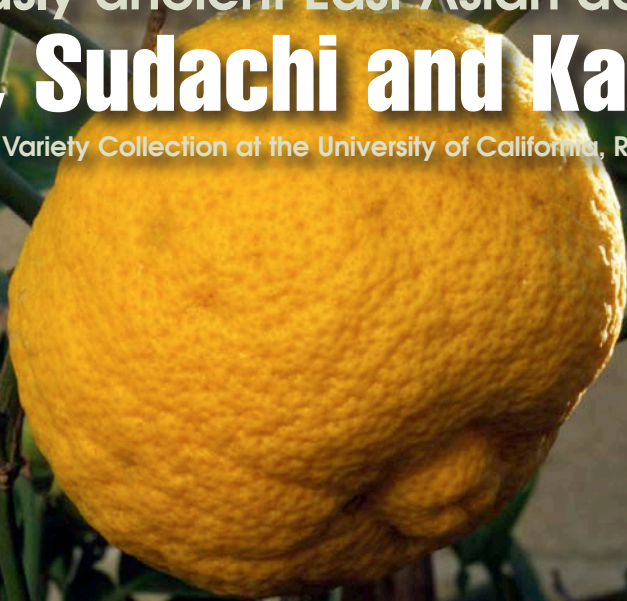
An Equatorial Rare Fruit Adventure

Discoveries While Roughing It in Ecuador

- ❖ All About Olive Oil
- ❖ Yuzu, Sudachi & Kabosu
- ❖ 5th Annual Pitahaya Festival

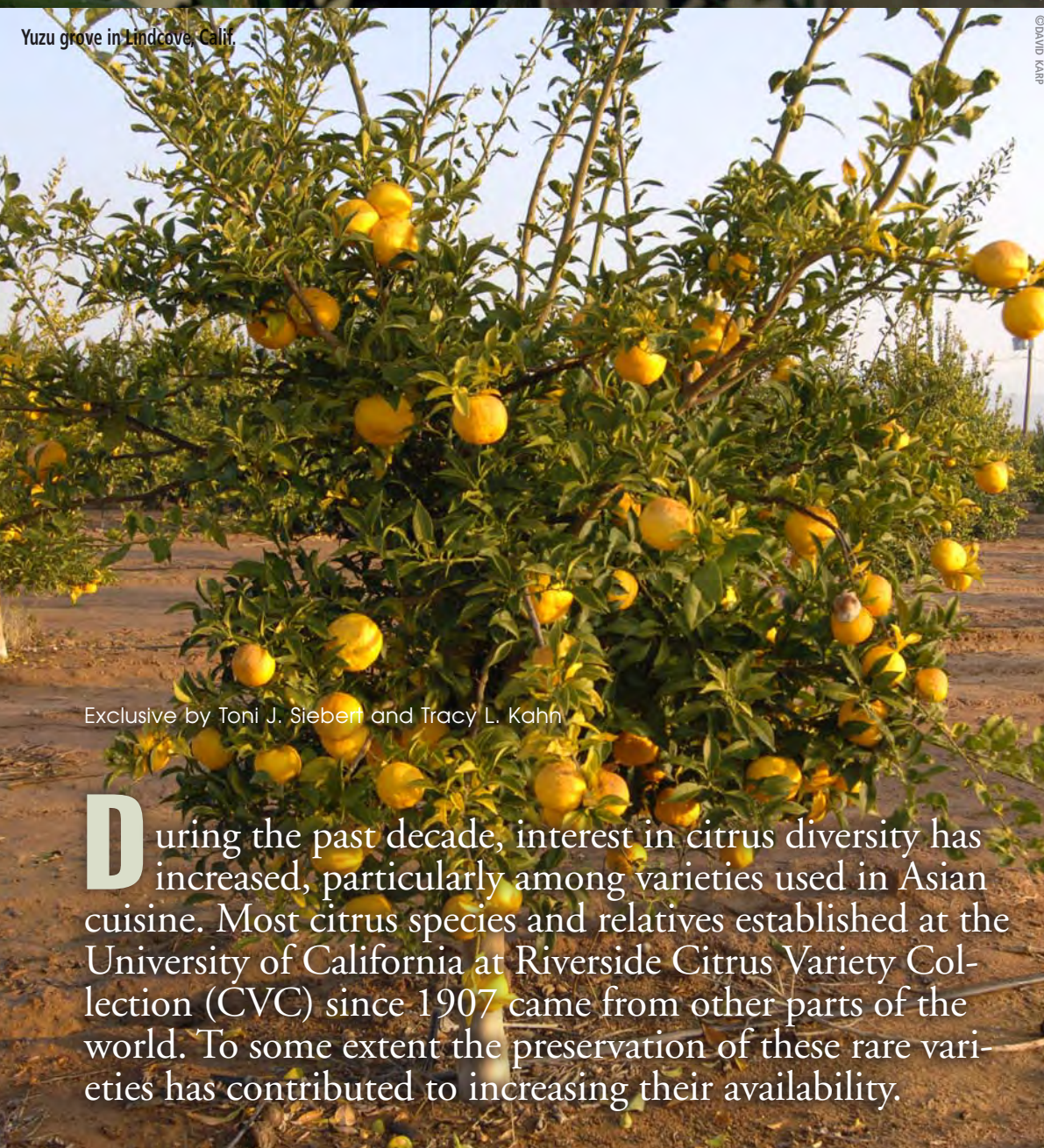
Deliciously ancient East Asian acid citrus Yuzu, Sudachi and Kabosu

From the Citrus Variety Collection at the University of California, Riverside



Kabosu fruit at a farm in Norco, Calif.

Yuzu grove in Lindcove, Calif.



Exclusive by Toni J. Siebert and Tracy L. Kahn

During the past decade, interest in citrus diversity has increased, particularly among varieties used in Asian cuisine. Most citrus species and relatives established at the University of California at Riverside Citrus Variety Collection (CVC) since 1907 came from other parts of the world. To some extent the preservation of these rare varieties has contributed to increasing their availability.



Yuzu fruit, UCR-CVC collection



Yuzu fruit, UCR-CVC collection



Sudachi fruit, UCR-CVC collection



Sudachi fruit, UCR-CVC collection



Kabosu fruit, UCR-CVC collection



Kabosu fruit at a farm in Norco, Calif.

In February 1963, Dr. Willard “Bill” Bitters, curator of the CVC from 1946 to 1982, visited with Dr. Tyozaburo Tanaka in Japan to learn more about Japanese citrus varieties and meet with other local citrus researchers. Although the CVC had previously obtained some Japanese varieties such as Yuzu (*Citrus junos* Sieb. ex Tanaka), the trip resulted in the addition of several new types to the CVC over the next 20 years. In addition to several Japanese grapefruit and pummelo types, these included papeda-like acid citrus selections with a long history of culinary usage in East Asia called Sudachi (*Citrus sudachi* Hort. ex Shirai) and Kabosu (*Citrus sphaerocarpa* Hort. ex Tanaka). Papeda is a citrus subgenus. Yuzu had been acquired by the CVC in 1918, but Sudachi was imported soon after the 1963 trip, and Kabosu followed in 1984. The limited fresh supply of these acid citrus fruits in United States markets has been hard pressed to meet increasing demand by consumers and restaurant chefs for ethnic cooking. Multiple requests for these three fruits convinced the CVC to formally evaluate them for possible commercial potential in September and October (during the young green stage) of the years 2003 to 2007.

Yuzu is the most popular of the acid citrus used in food preparation in East Asia. Tanaka wrote that it was thought to have originated in Korea and from there was introduced into China, and eventually made its way into southern Japan during the Tang Dynasty approximately 1,000 years ago (Taninaka, 1981). Other scientists maintain that the center of origin of Yuzu is in the upper reaches of the Yangtze river, in China (Rahman et al., 2001). The fruit is believed to be a hybrid of a papeda and a mandarin. In 1914, Frank N. Meyer, a plant explorer for the USDA, found Yuzu (which he originally named Kansu orange) growing wild in the southern part of Gansu province among palms, loquats and bamboo. He estimated

that the temperatures in that area dipped to 10F, and no other cultivated citrus grew nearby. He collected seed and sent it back to the United States.

Later in 1922, Tanaka discovered that the Kansu orange was identical to the Yuzu accession that the USDA had already held for several years in their greenhouses. It was then believed that Yuzu was probably imported prior to the 1900s by Japanese immigrants for use in their own gardens in the U.S. (Karp, 2003). The CVC received seed of this accession in 1918, a few months before Meyer’s untimely death. With the seed, Meyer included a description stating that it was “collected from the Hubei province, China, along the Yangtze River, in a field on a slope at the elevation of about 4,000 feet.”

Currently there are numerous Yuzu selections and hybrids in Japan and China, some of which originated from seedlings that germinated in the fruit waste of ancient dwellings (Taninaka, 1981). Japan and Korea are currently the largest producers of Yuzu fruits (Sawamura, 2005).

Yuzu is commonly used for cooking because its rind is very fragrant; it is used for enhancing flavors in many dishes including soups, fish, candies and medicinal teas. There have been a few reported studies of the uses of essential oils of Yuzu peel in cosmetics and aromatherapy (Sawamura, 2005). A sauce made with juice from the fruit, called Ponzu, serves as a vinegar substitute. Jams, jellies and marmalades are also prepared using the juice, as well as beverages and liqueurs (Abkenkar, 2003). The fruits are used in nearly all stages of maturity, from young with a green rind to over-mature, puffy, and with a dark yellow rind.

Yuzu fruit was formally evaluated by the UCR Citrus Variety Collection in September and October of the years 2003 to 2007, both at Riverside, Calif., and at the Lindcove Research and Extension Center near Exeter, Calif. The average fruit has a

mean width of 4.73 cm (1.9 inches) and a height of 4.31 cm (1.7 inches), giving an average height-to-width ratio of 0.90 and an oblate shape, and a mean weight per fruit of 52 grams (1.83 ounces). Rind color break for citrus fruit occurs at a rating of 4, where the rind color changes from a dark green to a yellow-green, which would be a rating of about 6. Yuzu consistently reached color break during the first week of October. The rind texture is pebbly and rough, with a mean thickness of 3.9 mm (0.15 inches), where a lower number such as 2.5 means thinner rind. Fruit samples from Lindcove generally have thicker rinds than those from Riverside, a warmer location. Yuzu averaged 27.7 seeds per fruit, but since it is primarily used for its peel and juice, not consumed fresh like navel oranges or mandarins, seed content is not of evident concern. The rind is not easily peeled in the green stage, but peels better when the fruits are mature. The mean juice weight per fruit is 10.0 grams (0.35 ounces) and the average juice content is 18%, most likely due to the presence of numerous plump seeds. There was an increase of juice percentage during the sampling dates. The internal flesh color of Yuzu in the green stage is light green to pale yellow. As Yuzu is highly acidic with an average of 4.5% citric acid, it is used much the way lemon would be used in the U.S.

The tree shape and growth habit of Yuzu is upright, spreading and moderately vigorous. Older non-pruned trees tend to have tall, rigid branches. Thorns up to 5 mm in length are present in each leaf axil. Leaves are elliptical in shape with a winged petiole of medium width. The tree canopy has medium density branching. Twenty-six-year-old trees on Carrizo and C-35 citrange rootstock are fairly vigorous and approximately 14 feet tall at Riverside, Calif. There have been no indications of rootstock-scion incompatibility or disease susceptibility using these rootstocks. (turn to page 6)

CULTIVAR	YUZU			SUDACHI			KABOSU		
	N	Mean	Range	N	Mean	Range	N	Mean	Range
Fruit length (cm)	48	4.31	3.30–6.10	38	3.38	2.60–4.30	38	5.17	4.20–6.50
Fruit width (cm)	48	4.73	3.60–9.00	38	3.79	3.00–4.80	38	5.25	4.30–6.40
Length-width ratio of fruit	48	0.90	0.70–1.00	38	0.88	0.80–1.00	38	0.98	0.90–1.10
Fruit weight (grams)	48	51.96	22.60–119.50	38	27.18	12.60–53.40	38	71.23	42.40–126.90
Texture based on chart	48	3.89	2.00–5.00	38	2.43	1.00–3.50	38	2.95	2.00–4.50
Rind thickness per fruit (mm)	48	3.90	2.70–5.90	38	1.91	1.10–3.00	38	4.16	2.80–5.40
Number of seeds per fruit	48	27.66	20.40–40.50	38	9.11	5.30–13.40	38	17.19	10.60–23.70
Total soluble solids or sugars	46	11.84	7.70–22.70	37	11.32	10.60–12.90	36	9.92	7.60–16.50
Percentage acidity based on citric acid	46	4.47	2.60–6.60	37	5.00	4.50–5.50	36	3.23	1.90–4.60
Solids-to-acid ratio	46	2.68	1.60–4.60	37	2.38	2.10–2.60	36	3.14	2.00–4.50

Note: “N” is the number of 10 fruit samples used to calculate the mean and range for each of the characteristics listed above. The length-width ratio is a measure of fruit shape. Fruit with length-width ratios greater than 1.0 are taller than they are wide. Conversely, fruit with length-width ratios less than 1.0 are oblate in shape or wider than they are tall. Rind texture is based on a scale of 1–6 where fruit with a rating of 1 having very smooth rind and those with a rating of 6 having very rough rind. Total soluble solids is measured with a refractometer and is an indicator of sugar level. Solids-to-acid ratio is a ratio of the total soluble solids to percentage acidity ratio and is used as a legal standard for sweet oranges and mandarins.

Go Ahead; Prove Me Wrong

It puzzles me that no one has volunteered for, or expressed curiosity about, preparing the chapter calendar that appears in each issue...

AS YOU CAN SEE, I'M GOING TO BE BRIEF. Last-minute content and layout decisions forced me to make some changes that required placing two of our advertisers' messages on this page. In case you were anticipating it, I regret to tell you that the Musco Family Olive



Company article I promised in my last column will not appear. Probably not ever. The author and I wanted to pass along some interesting information about that firm's modern plant and their efforts to lead in the green

movement. But they turned out to be too reserved about the trade secrets of their operations for us to be able to flesh out

and properly illustrate a decent feature.

That disappointing development leaves me with little room to make another appeal for a volunteer to prepare the chapter calendar information that appears in each issue of the *Fruit Gardener*. But appeal I must.

The calendar you see at the right is the last that Herb Lee will produce. Herb has been dealing with difficult physical challenges, and it is something of a miracle that he produced this calendar. He has been performing this important chore for years with no fanfare, no complaint. But he can't do it anymore.

It puzzles me that no one has yet even inquired about this need. Perhaps this time someone will come through. I hope so.

—fg@crfg.org

CHAPTER CALENDAR

Please send listings to berblee@bates-lee.com by the 15th of odd-numbered months. The term "TBA," as used here, means "to be announced."

ARIZONA

November 12, 7:30 p.m. Chapter meeting. Maricopa County Agricultural extension office, 4341 East Broadway Road, Phoenix, Arizona. Contact Patrick Hallman at 602-348-5576 for info.

December 10, 7:30 p.m. Chapter meeting. Maricopa County Agricultural extension office, 4341 East Broadway Road, Phoenix, Arizona. Contact Patrick Hallman at 602-348-5576 for info.

CENTRAL COAST

November 14, Noon-1:30 p.m. Special Youth Meeting. Location TBA. For more information contact Art DeKleine, program chair, at adeklein@calpoly.edu or 543-9455; Joe Sabol at jsabol@calpoly.edu or 544-1056. Refreshments by the A-G team, please!

December 12, Noon Annual Christmas Potluck and Plant Raffle. For more information contact Art DeKleine, program chair, at adeklein@calpoly.edu or 543-9455; Joe Sabol at jsabol@calpoly.edu or 544-1056.

FOOTHILL

December 5, 9:30 a.m. Chapter meeting at L.A. Arboretum, Lecture Hall room B., 301 Baldwin Ave., Arcadia. For more info call Joel Johnson at 626-791-0686.

GOLDEN GATE

Call 510-841-8447 for meeting times and locations.

INLAND EMPIRE

November 12, 7:00 p.m. Chapter meeting at The Jurupa Mountains Cultural Center, 7621 Granite Hill Dr., Riverside.

December 10, 7:00 p.m. Chapter meeting at The Jurupa Mountains Cultural Center, 7621 Granite Hill Dr., Riverside.

LOS ANGELES

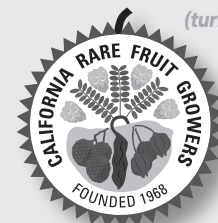
November 28, 10:00 a.m.-noon Chapter meeting at the Sepulveda Gardens in Encino. Call Bill Brandt at 805-492-3864 for details.

December Call Bill Brandt at 805-492-3864 for info.

MONTEREY BAY

Call Ellen Baker at 831-662-2216 for information.

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FRUIT GARDENER

California Rare Fruit Growers

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Editorial: Calendar or event information must be submitted only to a designated recipient (see calendar on page 2). Written material must be submitted to the editor two months before the first month imprinted on the cover of the issue in which the material needs to appear, and may be e-mailed as part of a message or as an attached file. If submitted on disk or CD, also send a hard-copy printout. Submission of material does not guarantee its publication. Include a self-addressed, stamped envelope if return of material is desired. Use a dark ribbon and double space all mechanically typed text. Send submissions to:

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The *Fruit Gardener* is published bimonthly by
California Rare Fruit Growers, Inc.
Fullerton Arboretum—CSUF
P.O. Box 6850, Fullerton, CA 92834-6850

ISSN 1049-4545

On the Web <http://www.crfg.org/>
Fruit-growing information info@crfg.org

For details about the CRFG website, contact our webmaster
E-MAIL www@crfg.org

California Rare Fruit Growers, Inc. is a non profit organization. It was founded in November 1968 by John M. Riley and Paul H. Thomson.

FEATURES

Yuzu, Sudachi and Kabosu (INSIDE FRONT COVER)

The Citrus Variety Collection is an amazing and invaluable repository operated and maintained by the University of California, Riverside. UCR Scientists Toni Siebert and Tracy Kahn wanted to inform members about three acid citrus cultivars.

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When Felipe Osborne Shea mentioned a trip to Ecuador not long ago, he conveyed few hints about what a unique and fascinating place he would be visiting.

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Five enthusiastic photographers took the time and trouble to record many scenes and situations during the 2009 Festival. Here they share the fruits of their labors.

Olive Oil Preferences: It's All About Familiarity 20

Alexandra Kicenik Devarenne and Paul Vossen originally wrote this article for the University of California Extension Service *First Press* newsletter. It offers the essentials of Mr. Vossen's olive oil tasting presentation during the 2009 Festival.

5th Annual Pitahaya Festival (INSIDE BACK COVER)

You won't find a more enthusiastic evangelist for pitahaya, or dragon fruit, than Edgar Valdivia. Here he offers a brief account of this year's Pitahaya Festival, the fifth such event. Next year will be Year of the Pitahaya. No doubt Edgar can hardly wait.

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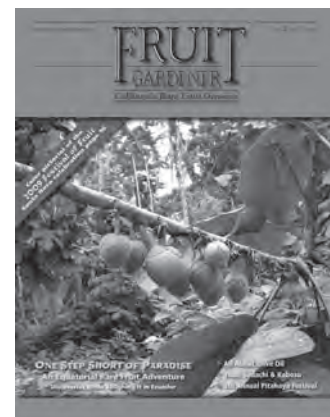
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ON THE COVER

PHOTO BY FELIPE OSBORNE SHEA. This image of a *Pouteria* species growing in the Ecuadorian rain forest is an eye catcher because of its extraordinarily unique appearance.

I Look Forward to All the Friendly Faces

It's not just the fruit that draws us to converge annually for our Festival of Fruit; far more than that, it is the great people we meet and get to know

DURING THE PRELIMINARIES AT EACH YEAR'S Festival of Fruit, as president I usually am asked to make a few remarks and then to get out of the way. Because I am allotted so little time, and since everyone there is anxious to move on to the presentations anyway, I generally just extemporize briefly, thank everyone for coming and bid them a good time. This year in Santa Rosa was no different—even though the guy with the hook waiting to pull me off the stage wasn't quite as conspicuous as usual. I had been thinking all



morning about what CRFG and these festivals mean to me, and my remarks pretty much came out as a continuation of those thoughts. Ron Couch, editor of this beautiful magazine, thought he detected a rare note of sincerity and asked me to expand or at least to reprise those remarks in this column.

Herbert Lees, cofounder of the West Los Angeles chapter and normally an annual fixture at the Festival of Fruit, had passed away a few weeks before the latest one; he was memorialized in the September & October *Fruit Gardener*. Although I saw him only at the festival each year, that alone sort of made the event “official” for me. I then thought about the other familiar faces I so look forward to seeing each year, regulars I can count on to be there and to support the event. Even Ron Couch, with whom I converse frequently by phone and several times a day via email, I see only once a year at these events (sorry Ron, but I don't do heat, humidity, and swamps).

So as I approached the microphone, my brain somehow made the leap from these thoughts to a summation of why all of these regulars joined, stay active in CRFG and attend these events, sometimes at considerable bother and expense. People join CRFG for the fruit, same as I did, but stick with the organization for the great people they meet and get to know. That is admittedly a generalization. I believe it apt, however, to characterize the members of CRFG as generous, friendly, helpful individuals dedicated to promoting our goals of educating others and spreading the joy of growing fruit. They will freely lend a hand, provide a cutting or seedling, tell you everything they know about growing a plant (fruiting or not), and critique your garden

without critiquing you. They are, I said, the best group of people you can know. And I meant it! They are friends of a quality that you simply can't find just anywhere.

Dr. Chiranjit Parmar, CRFG member in India and frequent contributor to the *Fruit Gardener* and to online discussion groups, is a man with a mission. Almost two years ago he started up a website, <http://www.fruitipedia.com/>, with the intent of documenting every fruit in his encyclopedia. Call it *Fruitipedia*. As he got well into writing the articles and putting them online, the enormity of the task he had undertaken became more apparent than when he had begun. There are, he estimates, at least 6,000 fruits eaten around the world and the effort to document each of them, however small, becomes a major effort. Think of it: what a gargantuan task for one man. Despite working assiduously since the beginning, as of this writing he has managed to display and properly document only 320 fruits. So he is asking for your help in writing a few articles, documenting a few fruits and adding to this repository of knowledge.

Please take a look at the website, and then share your thoughts with Dr. Parmar. He welcomes your comments, suggestions, criticism and support, keeping in mind that he is a scientist, not a web guru. See something missing? Offer to write about it. You need not be the “resident expert,” just someone with enough interest to do a little research at a local horticultural library or to check with a local nursery or grower. A small color photo suitable for a web page, whether for your article or for one already posted, would be most appreciated. Remember that Dr. Parmar, however knowledgeable, specializes in the fruits of Himalayan foothills and of India, not what you are growing in Simi Valley, so you have knowledge and information to add that would be most welcome.

Dr. Parmar can be reached via email at parmarch@sancharnet.in or by postal mail at 186/3 Jail Road; Mandi HP 175001, India.

Finally, I want to appeal once more for someone to undertake the responsibility of compiling the CRFG calendar. Herb Lee's last effort is in this issue. Please consider this. We need help and have had not one volunteer.

president@crfg.org

CALENDAR

(from page 3)

NORTH SAN DIEGO COUNTY

November, 7:00 p.m. Yearly planning meeting Mira Costa College room 7003 One Barnard Drive, Oceanside. Parking is in lot 3E and no permit is required during meeting times. For more information call Tony Thomas at (760) 505-4400.

December Holiday party. Date and place TBA.

January Scionwood Exchange. Date and place TBA. For info call Tony Thomas at 760-505-4400.

ORANGE COUNTY

November 19, 7:30 p.m. Chapter meeting. Persimmon panel with Isabel Barkman, Dewey Savage, Kay Havens and Jack Jewell. Silo Building, Orange County Fairgrounds in Costa Mesa. For info email Pam Lua: canyon.girl@att.net.

December 17, 6:30 p.m. Holiday potluck. Orange County Fairgrounds in Costa Mesa. For info email Pam Lua: canyon.girl@att.net.

January 21, 7:30 p.m. Annual grafting demonstration meeting in the Silo Building, Orange County Fairgrounds in Costa Mesa. For info email Pam Lua: canyon.girl@att.net.

January 23, 9:00 a.m. Great Scionwood Exchange in the Barn at the Silo Building, Orange County Fairgrounds in Costa Mesa. For info email Pam Lua: canyon.girl@att.net.

REDWOOD EMPIRE

Call Phil Pieri at 707-795-6574 for info.

SACRAMENTO

January 17, 10 am.–1:00 pm. Annual scionwood exchange. Sacramento Cooperative Extension Center, 4145 Branch Center Road, at the corner of Branch Center Rd. and Kiefer. Call Jimmy Barsch at 916-482-3181 for info.

SAN DIEGO

November 18, 7:00 p.m. Chapter meeting. Casa del Prado, Balboa Park. For info or other details call José Gallego at 619-697-4417.

December 16, 7:00 p.m. Chapter meeting. Casa del Prado, Balboa Park. For info or other details call José Gallego at 619-697-4417.

SANTA CLARA

December 12, 1:00 p.m. Chapter meets the second Saturday of even-numbered months from 1:00–4:00 p.m. at Emma Prusch Farm Park, multi-purpose room, 647 South King Road, San Jose. For details or other info, email Jack Kay: kay639@yahoo.com.

SEQUOIA

For meeting info email Martin Berghuis: mberghuis@hughes.net.

SOUTH BAY

November 14, 10:00 a.m.–Noon For info email south_bay@crfg.org or phone Rose Arbuckle at 310-326-4542.

December 12, 10:00 a.m.–Noon Chapter meeting. South Coast Botanic Garden, 26300 Crenshaw Blvd., Palos Verdes Peninsula. For more info email south_bay@crfg.org or phone Rose Arbuckle 310-326-4542.

VENTURA / SANTA BARBARA

January 16, 10:00 a.m.–Noon Chapter meeting. The Beard Ranch, 200 Ellwood Ridge Road, Goleta. Self-guided Ranch tour, scion exchange and grafting demonstrations. Norm Beard will offer for sale many varieties of bareroot trees, as well as the usual trees (turn to page 26)

WARM UP WITH WINTER DELIGHTS

Fran Jenkins, Food Co-Editor

Olive oils differ in quality, smoke point, color, flavor and aroma. The quality of olive oil is determined by acidity at the time of pressing. Genuine "extra-virgin" oil has less than 1 percent acid and should have perfect flavor and aroma. If the acid level is 1 to 3 percent it is considered "virgin," and may be treated by various means to improve acidity and remove off-flavors. It is usually sold as "pure." Since cooking reduces the flavor of extra-virgin oil, it's a waste of money to use it in baking, sauces or recipes using other ingredients that might overpower its taste. So save the best oil for salads and other cold dishes or to drizzle over hot dishes just before serving.

Rolled Stuffed Turkey Cutlets

This is a tasty dish that works well on holiday buffet tables. As an alternative to the individual rolls the pounded cutlets can be laid flat and overlapped to make one long piece.

6½-inch thick turkey cutlets, sliced from the breast	4 tablespoons olive oil
1 pound sweet Italian sausage without fennel seeds	2 tablespoons butter
6 large fresh sage leaves	1 cup dry white wine
1 garlic clove, peeled	1 cup canned whole tomatoes, drained
2 tablespoons fresh rosemary leaves	Salt and freshly ground black pepper
	15 sprigs flat-leaf parsley, coarsely chopped
	30 large black Greek olives in brine, drained

Pound the cutlets between two pieces of plastic wrap until thin. Lay the cutlets flat and divide the sausage into 6 equal parts. Shape into a roll and place on each of cutlets. Fold each cutlet into a fat roll, tucking in the ends and tie with kitchen twine.

Finely chop the sage, garlic and rosemary together. Heat the oil and butter over medium high heat in a frying pan, add the chopped herbs and sauté for 2 minutes. Put in the turkey rolls and sauté for 5 minutes, turning frequently to cook evenly but keeping them a light color.

Add the wine and let it cook and evaporate for 15 minutes.

Purée the tomatoes in a food processor and add to the turkey. Season with salt and pepper and cook, covered for 20 minutes.

Add the parsley and olives to the pan; mix well. Cover and cook for 10 minutes.

To serve, remove the string and slice each turkey roll about ½ inch thick. Top with pan juices and serve hot. Serves 6.

Mixed Vegetable Gratin

This delicious vegetable mélange works well served warm or at room temperature. Try pairing it with a baked potato, omelet or frittata, or simply as an appetizer over bread or crackers.

1 eggplant about 10 ounces, cut in 1-inch cubes	6 plum tomatoes, cubed
Salt	½ cup flat leaf parsley, coarsely chopped
1 pound very small new potatoes	½ cup basil, coarsely chopped
4 tablespoons olive oil, divided use	2 tablespoons fresh oregano leaves, coarsely chopped
2 medium green and red peppers, seeded, cut in 1-inch squares	8 ounces fresh mushrooms, quartered
1 red onion, coarsely chopped	1 can (14-ounce) black olives, drained
4 cloves garlic, coarsely chopped	2 tablespoons fresh basil, minced
½ teaspoon salt	1 tablespoon lemon zest, grated
Black pepper freshly ground, to taste	2 cloves garlic, minced

Toss eggplant with salt and let drain in a colander for 1 hour. Rinse and pat dry.

Cook potatoes in water until just tender, about 25 minutes. Drain. Heat oven to 350F. In a large skillet heat 2 tablespoons oil. Sauté peppers, onion and chopped garlic for 5 minutes. Season with salt and pepper. Stir in remaining 2 tablespoon oil, tomatoes, parsley, chopped basil, oregano and eggplant. Transfer to an oven-proof casserole.

Cover and bake 30 minutes. Stir in potatoes, mushrooms and olives, bake 30 minutes more, stirring once after 15 minutes.

In a small bowl, stir minced basil, lemon zest and minced garlic. Stir into vegetables. Serve warm or at room temperature. Serves 8 as side dish.

Spicy Applesauce Cake

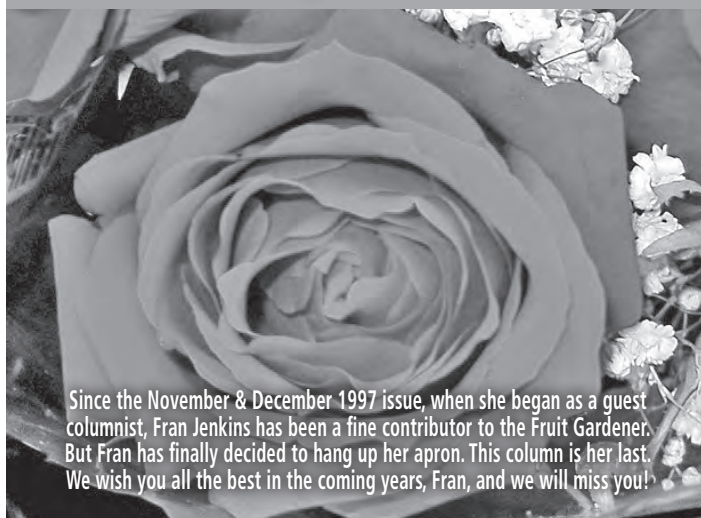
A moist, delicious cake made with olive oil. This recipe is from the International Olive Oil Council.

1 cup brown sugar	1 teaspoon ground cinnamon
½ cup olive oil	1 teaspoon ground cloves
1½ cups applesauce	1 cup raisins
2¼ cups all-purpose flour	1 cup walnuts, chopped
2 teaspoons baking soda	Powdered sugar, for dusting

Preheat oven to 375F. Combine brown sugar and oil in mixer and beat until light. Add applesauce and mix. Combine flour, soda and all spices together. Add flour mixture all at once to applesauce and mix until no visible flour remains. Stir in raisins and nuts. Spoon into a well-greased 9-inch square baking pan. Bake for 30 to 40 minutes until lightly browned. Let cool in pan and dust with powdered sugar. Cut into squares to serve. Serves 9.

*Please send inquiries, suggestions or recipes to the CRFG Kitchen. Address them to **CRFG Food Editor**, 1407 Ellsworth Circle, Thousand Oaks, CA 91360; or e-mail them to kitchen@crfg.org.*

THANK YOU, FRAN!



Since the November & December 1997 issue, when she began as a guest columnist, Fran Jenkins has been a fine contributor to the Fruit Gardener. But Fran has finally decided to hang up her apron. This column is her last. We wish you all the best in the coming years, Fran, and we will miss you!

Of the three acid citrus types described, Sudachi comes in second in production to Yuzu (Taninaka, 1981). Thought to be a hybrid of a papeda and a mandarin, Sudachi arose as a chance seedling in the Tokushima Prefecture of Japan, on Shikoku island, where it has traditionally been grown (Kawada, 1986). When harvested young, Sudachi is considered to have a distinctive fragrance that is different from Yuzu. The young fruits are used for cooking while still green, often being incorporated into vinegars or flavoring many different entrees, especially fish (Bitters, 1963). In dishes that utilize Sudachi, it is customary for the fruit to be sliced into thin wedges, adorning the main course. The flavor is now also used in soft drinks and alcoholic beverages. The fruits are produced for both processing and fresh fruit markets, with such demand that specialized storage systems were created to extend the market season (Kawada, 1992).

Fruit of Sudachi was formally evaluated by the UCR Citrus Variety Collection in September and October of the years 2003 to 2007 at Riverside, Calif. Significantly smaller than Yuzu, the average fruit size has a mean width of 3.8 cm (1.5 inches) and a height of 3.4 cm (1.3 inches), giving an average height-to-width ratio of 0.90 and an oblate shape, although some fruits can be round. Sudachi has a mean weight per fruit of 27.2 grams (0.96 ounces). Color break was reached between the first and third week of September. The rind texture is slightly pebbly with a mean thickness of 1.9 mm (0.07 inches). The number of seeds per fruit averages 9.1, much less than the average Yuzu fruit. The mean juice weight is 9.6 grams (0.34 ounces) and the average juice content is 34.4%, higher than Yuzu, which is fitting as Sudachi is primarily used for juice. The juice weight and juice content increased during the sampling dates. The internal flesh color of Sudachi in the green stage is light green to green-yellow. Sudachi is slightly more acidic than Yuzu with an average of 5% citric acid.

Sudachi trees tend to have a spreading habit of moderate vigor, but can be considered a small- to medium-sized tree, as 26-year-old trees on Carrizo and C-35 citrange rootstocks are only approximately 8 feet tall, with no indications of rootstock-scion incompatibility. Thorns up to 5 mm in length are present in each leaf axil. Leaves are


elliptical in shape, with a small-winged petiole. The tree canopy has dense branching.

Kabosu is said to have originated as a chance seedling that became established in the Oita Prefecture of Japan, located on the northeastern coast of the island of Kyūshū (Tanaka, 1981). There are many uses for the fruits, the most popular being in the creation of vinegars and marmalades, as a substitute for lemon on fish, and in soups, and for decorative purposes (Bitters, 1963). Bitters also described the use of the dried peel of Kabosu being burned as a mosquito repellent. The trees also make a useful doorway ornamental.

Kabosu fruit was also formally evaluated in September and October from 2003 through 2007 at Riverside, Calif. Slightly larger than Yuzu, the average fruit size has a mean width of 5.3 cm (2.1 inches) and a height of 5.2 cm (2.0 inches), giving an average height-to-width aspect ratio of 0.98 and a more rounded shape. Kabosu has a mean weight per fruit of 71.2 grams (2.51 ounces). Color break for Kabosu occurs between the first and third week of September. The rind texture is slightly pebbly with a mean thickness of 4.2 mm (.17 inches). The number of seeds per fruit averages 17.2, higher than Sudachi, but lower than Yuzu. The mean juice weight is 20.2 grams (0.71 ounces) and the average juice content is 28.2%, slightly higher than Yuzu, but lower than Sudachi. The juice weight and juice content increased during the sampling dates. The internal flesh color of Kabosu in the green stage ranges from light-yellow to dark-yellow. Kabosu tends to be the least acidic of the three acid types with an average of 3.2% citric acid.

Kabosu trees have a dense, spreading habit of moderate vigor. Trees that are 20 years old on Carrizo and C-35 citrange rootstocks are approximately 10 feet tall with no indications of rootstock-scion incompatibility. Thorns up to 5 mm in length are present in each leaf axil, but not present on every branch. Leaves are elliptical in shape, with a medium-winged petiole.

Budwood of Yuzu (VI 619) and Sudachi (VI 693) is currently available through the Citrus Clonal Protection Program (CCPP) as a specialty fruit. Kabosu is not available yet but will be in the future. You can go to the CCPP website at <http://www.ccpp.ucr.edu> for more information about how to obtain budwood. Please note that a minimum order of 12 buds per variety is required,

with a minimum total order of 36 buds per order. Registered users of the online budwood ordering system may visit <http://ccpp.ucr.edu/budwood/budwood.php>. If you are not a registered user please email ccpp@ucr.edu with your name, address, email and phone number, and the CCPP will generate a username and password for you. After becoming a registered user you will also receive announcements about future budwood distributions for other citrus varieties. Yuzu trees can be purchased online from the retail citrus nursery, Four Winds Growers, at fourwindsgrowers.com. Sudachi trees can be special ordered by contacting Aaron Dillon in the Four Winds Growers special orders department at specialorders@fourwindsgrowers.com. 

Toni Siebert, museum scientist, and **Tracy Kahn**, principal museum scientist and curator, both maintain the UCR Citrus Variety Collection which presently has more than 1,025 citrus and citrus relative accessions. Each year they evaluate new citrus varieties for trueness-to-type and commercial potential in California. Toni Siebert also maintains the Citrus Variety Collection's website: citrusvariety.ucr.edu.

Sources for Yuzu fruit

Deer Creek Heights Ranch (Lisle Babcock). Rt 4, Box 130, Porterville, CA 93257; <http://www.deercreekheightsranch.com> deercreekranch@ocsnet.net

Rising C Ranches (Eric and Kim Christensen) 12184 Ave. 472, Orange Cove, CA 93646; 559-626-7917; <http://www.ripetoyou.com>; Eric@ripetoyou.com; Kim@ripetoyou.com

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