



The Western Chestnut

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Postharvest handling and storage: The key to quality and customer satisfaction

Proper treatment of chestnuts during and immediately after harvest can make all the difference between a high-quality product customers will repeatedly ask for, and a product that won't even be remembered next season.

Professor Adel A. Kader, department of pomology, University of California-Davis, offers excellent information for postharvest handling of chestnuts. The following suggestions may help you maximize the quality and yield of your crop.

Harvesting chestnuts: Chestnuts should be picked up daily during the harvest season to minimize fungal infection and growth (if infection occurred while the nuts are still on the tree) and loss of quality due to excessive drying and/or sunburn. Use of a tarp below the tree can reduce contamination of the nuts due to direct contact with the soil. Alternatively, a mechanical shake-catch harvester can be used. Following harvest, the remaining burrs should be removed.

Optimum Temperature: -1 to 0° C (30 to 32° F); prompt cooling to 0° C (32° F) is strongly recommended to stop decay development and preserve quality.

Optimum Relative Humidity:

90 - 95%; packaging in microperforated plastic film is highly recommended to minimize water loss from fresh chestnuts.

(cont. page 3)

Celebrate National Chestnut Week!

Show the world you are proud to be a chestnut grower by promoting **National Chestnut Week, Oct. 10-16th!** Wear your National Chestnut Week t-shirt. Post a sign in your yard or orchard for motorists to see. Host an open house at your orchard. And perhaps most importantly, promote chestnut awareness by sending your local media a press release about National Chestnut Week.

Included in this newsletter is a press release that is ready to fax to your local newspaper, television and radio stations. A "ready for press" article is also available from WCGA president Harvey Correia. This may be just the unique story your local media outlets are looking for, and an excellent opportunity

to draw attention to the chestnut industry!
(see events pg. 4)

Carolyn and Ray Young show their National Chestnut Week spirit at the recent WCGA annual meeting, July 15-17, in Stockton, Calif.



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A Message from the President



WCGA PRESIDENT
HARVEY CORREIA
CORREIA CHESTNUT FARM
ISLETON, CALIF.

Greetings! It's with pride that I am serving as the association's President. I hope you will email me at harvey@chestnuts.us with your thoughts about things you'd like to see the WCGA doing. By now, many of you are well into chestnut harvest. For me here in Central California, chestnut harvest began in late August....a full two weeks earlier than in 2003. I've talked to several growers and most are expecting a good crop. Initial indications show that crop prices are stable, and I wish everyone a successful harvest.

If you have not already done so, please consider signing up for the WCGA's Growers' Directory service. A copy of this can be located at www.wcga.net/directory.htm. At the top of that web page is a link to a document to add your orchard to the directory. In addition to a press release included in this newsletter, we are having a sample article prepared to make it easier for the media to publish an interesting article on chestnuts. This article will direct readers to the Growers' Directory.

At the Northern Nut Growers Annual Meeting this year, another grower initiated a gathering of various chestnut growers one evening to discuss marketing ideas. This meeting included WCGA members as well as other growers that are not WCGA members. Most people agreed that the name Western Chestnut Growers Association carries with it the impression that it represents only growers in the western U.S., even though we have members located throughout the U.S. It was the opinion of the growers at this informal meeting that a group by the name of "Chestnut Growers of America" was desired to promote chestnuts throughout the U.S.

The question now is if we should consider a name change for the WCGA, or form a new entity for this purpose. I'd like to hear your thoughts on this matter. I've already heard good reasons for each choice. We do not expect to take any action on this matter without a consensus of the membership. Happy harvesting!

Harvey J. Correia

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POSTMASTER

Send address changes to WCGA, c/o PO
Box 841, Ridgefield, WA 98642.

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Full page, camera ready (w/1 photo) . \$20.00
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One classified ad per member per year is free (max 6 lines, \$2.50 ea add'l 6 lines). Ad space may be reserved with full payment but must meet established deadlines. For more information and specifications, contact Rachel McCoy at (573) 882-9866.

PUBLICATION DEADLINES

Fall issue deadline 9/10 mailed 10/1
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The Western Chestnut Growers Association cannot be held responsible for individual grower success using the chestnut production information presented from various authors. Information presented is accurate to the best of our knowledge; yet results will vary based on grower location, soil type, cultivar and management approach.



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Proper handling and storage

(cont. from page 1)

Responses to Controlled Atmospheres (CA): An initial exposure to 40-50% CO₂ for 5-7 days at 0° C (32° F) followed by storage in a controlled atmosphere (2-3% O₂ plus 15-20% CO₂) is very effective in preventing mold growth, sprouting and other quality deterioration factors. Exposure of fresh chestnuts to less than 1% O₂ results in fermentative metabolism and off-flavor development. Under optimal temperature of -1 to 0° C (30 to 32° F), relative humidity (90-95%), and a controlled atmosphere, fresh chestnuts can be stored for up to 4 months.

Physiological Disorders: Sprouting results from exposure to high temperature and humidity and can be avoided by using optimal storage conditions.

Pathological Disorders: Several fungi (including *Alternaria spp*, *Aspergillus niger*, *Botrytis cinerea*, *Fusarium spp*, *Penicillium spp*, and *Phomopsis castanea*) can infect chestnuts and result in significant postharvest losses in quality and marketability.

Disease control strategies include the following recommendations:

1. Use of effective preharvest integrated pest management program to control incidence and severity of insect infestations and fungal infections. This IPM program should include strict orchard sanitation which can also help in terms of food safety by minimizing microbial contamination.

2. Minimizing the time during which the chestnuts are on the orchard floor and avoiding their direct contact with the soil to reduce fungal infection and growth as well as possible contamination with human pathogens.

3. Washing the nuts with chlorinated, or otherwise disinfected, water followed by a hot water dip: 50° C (122° F) for 30 minutes or 55° C (131° F) for 15 minutes or 60° C (140° F) for 5 minutes. Following the heat treatment, the nuts should be cooled to 0° C (32° F) using forced-air cooling, which will also remove any surface moisture from the nuts.

4. An alternative to heat treatment is exposure of the nuts to air enriched with 40-50% CO₂ for 5-7 days at 0° C (32° F) since CO₂ is a fungistatic gas. This treatment can be followed by **A)** cold storage either in air (for up to 3 months) or **B)** CA (2-3% O₂ + 15-20% CO₂) for up to 4 months at -1 to 0° C (30 to 32° F) and 90-95% relative humidity.


Chestnut Quality Indices:

- **Size:** larger nuts are preferred by customers for fresh consumption
- **Shell color uniformity:** tan to light-brown or dark-brown, depending on the cultivar
- **Gloss:** bright and shiny
- **Plump and fresh kernels:** optimum eating quality at 25-30% moisture after roasting
- **Freedom from defects:** bruising, cracking, sprouting and decay
- **Ease of pellicle removal** (peelability) from the kernel
- **Sweetness as a taste factor:** chestnuts contain 40 to 50% carbohydrates (mostly starch) which is converted to sugars when the chestnuts are kept at 20-25° C (68-77° F) for 3-4 days just before sale to consumers.

Reprinted from University of California, Davis, Postharvest Technology Research and Information Center, "Produce Facts: Chestnuts: Recommendations for Retaining Postharvest Quality," July 2003, by Adel A. Kader.

This fact sheet available online at:
<http://rics.ucdavis.edu/postharvest2/Produce/ProduceFacts/Fruit/chestnuts.pdf>

Chestnut survey coming soon! The University of Missouri Center for Agroforestry (UMCA) is working to increase consumer demand for chestnuts and open chestnut markets. A research survey may arrive in your mailbox soon. Please help build the chestnut industry by returning the completed survey to UMCA. Together we can make a difference!



Help customers find you! Sign in to the Members' Directory at www.wcga.net!

National Chestnut Week Events

Sunday, Oct. 10: Open House at Allen Creek Farm, Ridgefield, Wash., Noon to 5 p.m.

WCGA members Carolyn and Ray Young kickoff National Chestnut Week with a public open house, featuring educational presentations about how chestnuts are grown and processed for the table; demonstrations of a sweeper and harvester; demonstrations of their stone mill grinding nuts into flour; samples of hot roasted chestnuts and chestnut bisque; free recipes; a European-style garden maze; and plenty of fresh chestnuts, dried chestnuts, chestnut flour and products for sale.

For more information, visit www.chestnutsonline.com

Saturday, Oct. 16: Chestnut Festival, Cadillac, Mich.

Celebrate the chestnut heritage with chestnut roastings, chestnut seedling distribution and a variety of harvest activities. Specialty chestnut foods and crafts, live music, cooking demonstrations, cultivar displays and children's activities are also featured. The festival takes place at Cadillac City Park and Rotary Pavilion.

For more information, call toll free at (800) 225-2537 or visit www.cadillacmichigan.com

Saturday, Oct. 16: University of Missouri Center for Agroforestry 2nd Annual Missouri Chestnut Roast, Horticulture and Agroforestry Research Center, New Franklin, Mo., 11 a.m. to 4 p.m.



The Missouri Chestnut Roast showcases the bounty of Missouri's agricultural products, including chestnuts, chestnut seedlings, pecans, walnuts, meats, jellies, wines and cheeses for sale. Guided tours of the diverse 660-acre agroforestry research farm will also be featured. (And of course, plenty of free roasted chestnuts, fresh from the research farm orchards, along with nutrition information about nuts!)

For more information, visit www.centerforagroforestry.org and select Upcoming Events.



Visitors to the Chestnut Festival in Cadillac, Mich., shop for chestnut seedlings packaged in mugs.

WCGA president to speak on coastal radio show

Members on the east and west coasts may soon hear the familiar voice of Harvey Correia, WCGA president and grower from Isleton, Calif., over their radio waves.

In an effort to promote **National Chestnut Week**, Oct. 10-16th, Harvey arranged an on-air interview with the popular "Produce Pair," a Weekly Radio Show hosted by radio personality Dan Avakian and Bay Area columnist Mark Ferro. The Saturday radio show talks to consumers about the enjoyment of fresh fruit and vegetables and airs on 16 stations in the Pacific Northwest and the East Coast through Universal Talk Network. In addition to radio coverage, Harvey spoke with Produce Pair member Dan Akavian for an October "Getting Fresh with Dan the Produce Man" article in the Bay Area publication the *Alameda Magazine*.

"It's critical to get the word out about chestnuts," Harvey said. "Study after study has shown that the typical person in the U.S. knows very little about chestnuts and has never tried them. If we can get them interested enough to try chestnuts, we can get them to be repeat customers and encourage others to try chestnuts. This isn't huge coverage, but it's certainly a step in the right direction toward building consumer interest and demand for chestnuts."

The chestnut segment airs with the Produce Pair on **Saturday, Oct. 9th, with broadcasts at 9 a.m. Pacific or 12 noon Eastern time**. If Universal Talk Network stations are not available in your area, current and past Produce Pair broadcasts can be accessed online at www.producepair.com.

Postharvest tips: preventing "wormy" chestnuts

by Greg Miller,
Empire Chestnut Company
Carrollton, Ohio

"My chestnuts are wormy!" is a common complaint from producers and consumers. The "worm" causing the problem is the larva of either the small chestnut weevil (*Curculio sayi* Gyllenhal) or the large chestnut weevil (*Curculio caryatrypes* Boheman). Both species are native to North America where they commonly infested American chestnuts before the chestnut blight epidemic. When the blight wiped out the American chestnut trees it also wiped out the chestnut weevils - almost. Now that chestnuts, mostly Chinese, have been widely planted the chestnut weevils have made a comeback. Many chestnut plantings in eastern North America are now plagued with these pests. The good news is that acceptable control is possible. The bad news is that without control, they can render the entire crop unmarketable.

Weevil grubs emerge from chestnuts shortly after harvest, but the problem begins before the chestnuts ripen. Adult weevils lay tiny eggs inside the shell, while the nuts are still on the tree. After hatching, the grubs eat tunnels through the nut kernel. Sometime after nut drop, they eat their way out through the shell, leaving pencil lead-sized exit holes in the shell. The squirming, cream-colored grubs, about 7-14 mm (1/4- to 1/2 in) long, are repulsive but harmless.

Adult chestnut weevils are hard-shelled beetles which vary in color from mottled light tan to dark brown, almost black. A prominent snout (proboscis) is as long as or longer than the body. The small chestnut weevil female is 5-11 mm (1/6 to 1/3 in) long; the large chestnut weevil female is 7-14 mm (1/4- to 1/2 in) long. Females have a much longer snout than males. Other than the difference in size, both the large and small weevils look similar.

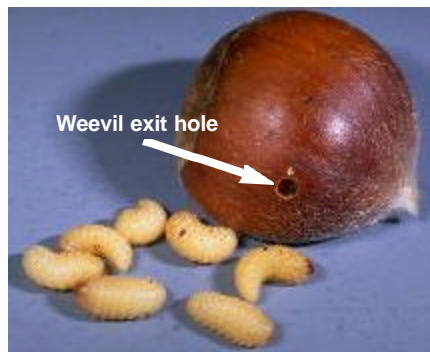
The small chestnut weevil is more common than the large, but both species are reportedly distributed wherever chestnuts occur. When both species are found together, the large chestnut weevil seems to predominate. But new weevil infestations are almost always the small species. Apparently, small chestnut weevils can fly several miles or more to find previously uninfested

trees. In our orchards, thus far, we have found only the small chestnut weevil.

Life Cycles of the Insects: Small Chestnut Weevils

Small chestnut weevils (*C. sayi*) emerge from the ground as adults during May and June. After emergence they remain on the ground for several days before flying. They can be found in chestnut trees during flowering, apparently feeding on catkins. After flowering they disappear and it is not known where they harbor for the two to three months between their emergence and their appearance in the trees at egg-laying time. Mating and then egg laying begin about three weeks before nut ripening, i.e., from mid-August to the beginning of September. Egg laying occurs throughout the nut ripening period. Adult females deposit eggs into the nut, usually on the round side through tiny holes that look like pin-pricks.

Three to five pear-shaped eggs are laid in each nut. Each adult female lays up to 50 eggs. Eggs hatch in about 8 days and the larvae tunnel through the kernel. Larval development is usually complete in two to three



Chestnut weevils emerge from shells soon after harvest, eating tunnels through the nut kernel.

weeks, but development time is very temperature dependent. Warm temperatures promote fast development while cold temperatures may delay emergence for two months or more. Larvae generally exit after the nut has fallen to the ground.

Full-grown larvae enter the soil, burrowing 5-20 cm (2 to 8 in) below the surface to hibernate inside earthen cells that they construct. They pass the first winter as larvae and most pupate and become adults by the next autumn. Then they pass the second winter as adults in the soil, and emerge the following May or June. Some larvae pupate the second autumn and pass the third winter as adults. In summary, small chestnut weevils usually have a two-year life cycle, but a few individuals delay to a three-year life cycle. This tactic ensures survival, and complicates control. **(cont. next page)**

Preventing weevils (cont. from page 5)

The extent of crop damage depends on weevil population and crop size. Weevil infestation can range from 0 to 100% of the crop. While the main damage is caused by feeding larvae, the adults also feed on nuts, and this provides a point of entry for fungus and yeast organisms. This damage is often not noticeable until after storage.

Large Chestnut Weevils:

Large chestnut weevils (*C. caryatrypes*) have a life cycle and habits similar to the small species except for the following differences. Adults emerge from the soil in late July to early September, just before egg-laying. Mating and egg laying begin when the kernel begins to form, from mid to late August, which is a week or two before the small chestnut weevil. Females usually lay no more than three eggs per kernel. Because of their earlier egg laying, a few larvae complete development and exit the shells before the chestnuts fall off the tree. Large chestnut weevils usually have a one-year life cycle, with a few individuals delaying until two years.

Control

Three control methods can reduce weevil infestation: sanitation, hot water treatment, and insecticide applications. Sanitation and hot water treatment target larvae, insecticide application targets adults.

Sanitation: Sanitation involves collecting fallen nuts before the grubs emerge. If the fallen chestnuts have exit holes, the grubs have already emerged and it's too late for sanitation to work well.

Collected nuts should be stored in containers from which emerging larvae cannot reach the soil, e.g.,

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plastic buckets. Be careful; weevils can chew through plastic or paper bags.

Make sure the weevils are destroyed - don't throw them outside! If sanitation is practiced consistently, it will prevent weevil populations from increasing. It is most effective when weevil populations are relatively low, (less than 5% infestation), and the orchard is isolated from other chestnut trees. For sanitation to work, the chestnuts should be picked up within three days after they drop. Sanitation won't work if a significant part of the crop is taken by chipmunks, squirrels, or other varmints that cache their food, since the cached chestnuts will allow weevil larvae to escape to the ground. After weevils have emerged, leaving obvious exit holes, the infested nuts can be destroyed. (Don't just throw them outside, some grubs may have not yet emerged!) Uninfested nuts can

be eaten.

Hot water: Rather than waiting for them to emerge, larvae or eggs can be killed inside the kernels by soaking the chestnuts in water at exactly 49° C (120° F) for about 20 minutes. The temperature is critical, the time of soaking less so. After soaking, the chestnuts should be allowed to cool and surface-dry before storage. This treatment kills the larvae but does not damage the kernel. If the chestnuts are promptly harvested and hot-water treated, many of the infested chestnuts will contain only unhatched eggs or very small larvae. These small infestations are not noticeable and can be eaten. On the other hand, if exit holes are present in the chestnut shells at treatment time, the weevils have already emerged. All chestnuts which have any chance of being infested should be hot water treated before being sold. **(cont.)**

Weevil Control (cont. from page 6)

Buyers have zero tolerance for living grubs crawling out of the chestnuts they bought, but seem to tolerate dead grubs in a few nuts. If one chestnut in a thousand is infested, this means that every 25 lb lot of chestnuts probably harbors several grubs; this is unacceptable. But most people don't mind discarding one in a thousand bad nuts.

Insecticides: When 10% or more of the crop becomes infested, insecticide sprays are necessary to produce marketable chestnuts. Insecticides have proven effective only when applied to adults during the mating and early egg-laying period. For small chestnut weevils this is mid-August to early September. Presently, the only insecticide labeled for chestnut weevil control is carbaryl (Sevin). Follow label instructions for application rates. Spraying should begin when adult weevils begin arriving in the tree crowns. Weevils tend to seek out early-ripening trees first. So, it is best to look for weevils on early trees, and spray whenever they are present. Spreading a large sheet on the ground and shaking branches is a good way to monitor weevil presence. (Weevils have a habit of dropping to the ground whenever they are disturbed.) Spraying should be done when the weevils are active, i.e., on warm, calm days. The interval between spray applications should range from three to seven days depending on weather and the presence of weevils. Two to four spray applications per season should be sufficient to provide adequate control.

Visit www.centerforagroforestry.org for a chestnut nutrition guide!

Second-hand chestnuts honor Italian holiday tradition

Lucienne Grunder of Owl Creek Ranch, Waterford, Calif., is used to finding creative solutions to challenges on her 85-acre chestnut orchard, possibly the largest in the United States.

So it's no surprise that even molded chestnuts, a casualty of a refrigeration problem, went to good use -- feeding suckling pigs, a tradition Lucienne experienced first-hand in Italy.

In preparation for last year's harvest season, Lucienne ordered a three-phase walk-in freezer. The commercial machine was pre-owned, but showed great promise to store thousands of pounds of chestnuts at the right temperature to prevent molding and sprouting (32° F).

However, the electric company completed the installation behind schedule for storing the first portion of the chestnut harvest. Once installed, Lucienne discovered the cooler was not reliable in maintaining the consistent temperature needed for proper chestnut storage. She also found the doors had been left open.

Consequently, Owl Creek Ranch found itself with 5,000 pounds of molded chestnuts to dispose of. That's when Lucienne

remembered the taste of roasted pork from chestnut-fed suckling pigs, a treat enjoyed in small towns in Italy between chestnut harvest and the holidays.

"It was a feast in the streets, really," Lucienne said. "It was wonderful meat, spiced with onions and rosemary and sweetened by the chestnuts. You could smell the aroma from a few blocks away."



Serving roasted chestnut-fed pork at Owl Creek Ranch during the WCGA meeting.

Soon Owl Creek Ranch became home to four suckling pigs, only six weeks old, and Lucienne began boiling and mashing the molded chestnuts. "The pigs loved it," she said. "Every day we nearly filled a ten-gallon container full of the cooked chestnuts, and soon they ate them 'au naturale,' raw and uncrushed."

Aside from serving the roasted pork at farm gatherings, including the July WCGA annual meeting, a Chinese deli owner has begun ordering the chestnut-fed pigs for roasting and selling during the holiday season. The pork is offered as a substitute for traditional roasted turkey.

Owl Creek Ranch is raising eight chestnut-fed pigs this year. "Chestnut-fed pork has a unique, sweet and juicy flavor that celebrates an Italian tradition," said Lucienne.



Don't miss it! Owl Creek Ranch will be featured in a Farm Bureau Network television documentary in late November or early December. Story to come in January issue.

"Flour Power:" Members explore value-added baking market with chestnut flour

Ray and Carolyn Young of Allen Creek Farm, Ridgefield, Wash., are truly enjoying the "daily grind."

The Youngs, WCGA members since establishing their 10-acre chestnut orchard in 1999, recently purchased an authentic stone mill for producing chestnut flour -- a fine-textured, versatile and nutritious flour used in European countries for centuries. The value-added product is "selling well for a new product," according to Carolyn, and is the newest addition to the Youngs line of retail items made with chestnuts, including packaged dried chestnuts, chestnut cornbread mixes, chestnut bisque mix and holiday gift collections.

"We knew from the start of our chestnut operation that we wanted to pursue value-added chestnut products, with a focus on retail sales," Carolyn said. "We didn't see packaged chestnut products anywhere in the industry and felt we could apply our computer science degrees toward marketing chestnut products online.

"Adding value to agricultural products is so important because the more products you have to offer customers, the more credible you become," she added.

Carolyn's allergies also played a role in the Youngs' pursuit of chestnut flour. Placed on a restricted diet that didn't permit wheat or corn products, Carolyn began reading about the gluten-free properties of chestnut flour, but found that stone-milled flour was not commercially available in the United States from a U.S. orchard. The Youngs saw a

potential new market for chestnut flour. "Chestnut flour is a gourmet treat for gluten-intolerant people," said Carolyn. "We were recently requested to send flour samples to a conference hosted by a Delaware Celiac support group for gluten intolerance, and have received several orders from attendees since.

"I remember thinking, 'this is a brand new food to the Americans,' even though people in Europe have been eating it, and sometimes surviving on it, for centuries," said Carolyn.

Like many food products, the first trial at producing chestnut flour revealed some unique challenges about milling the nuts. Having read about value-added products in the "Capital Press," a western farm paper, the Youngs began testing chestnut flour in an electric-powered home flour mill. The mill offered higher speed and more heat than a traditional stone ground mill, but also required the cumbersome process of chopping peeled chestnuts into small pieces prior to loading into the machine.

After reading that slow milling flour in a traditional mill actually retains more healthy nutrients than flour ground in a knife (conventional) mill, the Youngs moved ahead with a search for a stone mill last winter. Ray and Carolyn found some home mills in the U.S. that would accept



Ray and Carolyn Young are successfully selling freshly milled chestnut flour and investigating markets for people with allergies to gluten. Chestnut flour is well-tolerated by this group of consumers.

small grains, but not whole chestnuts, and expanded their search overseas. Carolyn learned from a company in France that one baker in America had actually purchased a stone mill, and soon the Youngs traveled to southern Oregon to see the machine first-hand.

"He was a fanatic about using stone mills for optimum quality flour, and we learned a great deal about the process from him," said Carolyn.

Though it produced excellent quality flour, the mill was only equipped for smaller nuts and grains -- meaning the Youngs would have to continue breaking up the nuts prior to loading, a time-consuming extra step.

As they were examining the grinder, Ray and Carolyn noticed a label stating that the grinder was actually made in Austria, not France, and would cost less than the French model. With language help from a German exchange student the Youngs hosted years ago, they

(cont. next page)

Flour Power (cont. from page 8)

ordered a mill made to their own specifications, designed to process one whole chestnut at a time in a well-controlled flow.

In January 2004, the Youngs traveled to Austria to bring the mill home and then spent the next six weeks setting up the machine and learning to use it. Unfortunately, the company had placed the wrong motor in the grinder, and the Youngs waited an additional six weeks for the right motor to arrive. After installing the motor, they learned some of the pulleys and belts were made to accommodate European measurements and didn't correspond to the new motor. The last step of the process was to purchase and install the appropriate parts into the machine.

The Youngs soon learned that processing chestnuts too quickly produced a gum-like film in the machine, which had to be cleaned periodically. With the right milling pace now achieved the machine rarely needs cleaning. Carolyn and Ray can mill 25 pounds of chestnut flour per hour, with one pound of dried chestnuts yielding a little less than one pound of chestnut flour.

Well-dried nuts are a key component to the milling process. After they took delivery of the mill in Austria, the Youngs went to Tuscany where they visited an ancient village's chestnut flour mill and observed that Italian folks in the chestnut industry dry the nuts up to 40 days by arranging the chestnuts on slats with small fires underneath. The smoke gives the flour a distinct flavor, but the Youngs prefer to send their chestnuts to a local walnut processor, where they are laid out and dried from heat generated under

the floor. Currently, the drying phase lasts two weeks, but Carolyn said it may be increased to a longer time period as there seems to be a strong connection between drier nuts and increases chestnut flour shelf life. Italian-processed flour may retain its quality for up to a year without becoming rancid. The Youngs recommend storing their chestnut flour in a refrigerator or freezer for longest life.



Carolyn Young carefully places peeled, dried chestnuts into her old-fashioned stone grinder.

"You just can't get the nuts too dry for milling into flour," Carolyn said. "It's a much longer drying process than walnuts."

In April, chestnut flour emerged on the Young's web site and is selling well at the retail level. Carolyn and Ray are considering selling the flour wholesale, but find the prices do not fully justify the process, which can be quite fulfilling but not exactly quick and convenient. After harvest-

ing, hulling, drying, and peeling the chestnuts, Ray and Carolyn carefully sort the nuts by hand at least four times before milling to ensure all parts of the pellicle are removed.

"No one could have more care and concern for the quality of the product than the growers themselves," Carolyn said. "Quality of product is absolutely essential, as is providing quality service to the customer."

The Youngs may expand from packaged chestnut flour to mixes featuring the product, including pancake and muffin mixes.

"We see value-added chestnut products as a good source of profit potential -- and a good use of the nuts that are too small for customers and might otherwise become a treat for our neighbors' pigs."

For more information about the Youngs' chestnut flour, visit www.chestnutsonline.com

Note: "Flour Power: The Complete Guide to 3-Minute Home Flour Milling," a book by Marleeta F. Basey, assisted the Youngs in learning about the flour milling process.

For added nutrition and texture, the Youngs suggest substituting one third of the flour in baking recipes for chestnut flour. Chestnut flour is also excellent for puree and crepes.

Annual meetings offers ideas, information sharing: Members attend WCGA and NNGA/NAFEX meetings

Marketing chestnuts, propagation and grafting techniques, harvesting challenges and cultivar selection were some of the key topics of discussion at the recent WCGA annual meeting, held July 16-17 in Stockton, Calif. A day of educational presentations was followed by a day of hands-on orchard tours, generating interesting discussion and sharing of ideas.

Friday's science and marketing-based presentations offered attendees new industry strategies. Dr. Terry Prichard, USDA extension at the University of California-Davis, spoke on the irrigation of chestnuts based on knowledge of irrigating walnuts. Dr. Tom Yamashita, Sunburst Plant Disease Clinic, presented on soil and plant nutrition and microbiology.

Past WCGA president Chris Foster and Dr. Michael Gold, associate director, University of Missouri Center for Agroforestry (UMCA), led a group discussion on membership feed back and the organization's newsletter.

Ken Hunt, UMCA post-doctoral fellow; Dr. Michele Warmund, professor, University of Missouri Department of Horticulture and UMCA research collaborator; and Dr. Michael Gold presented information on the university's research toward establishing the chestnut industry in Missouri. Hunt's presentation featured a discussion of the 50 cultivars the Center is experimenting with at the research farm's cultivar repository, established in 1996.

Warmund explained the tree improvement goals her research is geared toward: using a rootstock or interstem piece as a method for dwarfing the chestnut tree for more efficient production and harvest; evaluating methods of nitrogen application; and the benefits of thinning secondary burrs of Chinese chestnut varieties for increased nut size and yield the year after treatment. The Center is currently evaluating Little Giant or Cropper as rootstocks for chestnut trees with Eaton and Qing as scion cultivars.



The market pull strategy -- generating consumer interest and demand to pull more producers into production -- was explained by Gold as one way UMCA is working to develop the chestnut industry in the Midwest. The results of last year's visitor survey regarding awareness and knowledge of chestnuts, conducted at the Center's first annual Chestnut Roast, indicate nearly 75 percent of Missouri residents



Top, from left: Lucienne Grunder (far left) talks with Michele Warmund, Carolyn Young and Elizabeth Shepherd at Owl Creek Ranch. **Left:** Members observe Harvey Correia's (middle) grafting and fertilization techniques.

have very little or no experience with chestnuts. Efforts at the University of Missouri are designed to change the way people think about chestnuts through educational campaigns, in-store promotions and the annual Missouri Chestnut Roast. "We want to move chestnuts from a holiday food to an every-day food," said Gold. "We found price had little influence on purchasing decisions for these shoppers, but quality and ease of preparation were very important."

(cont. page 11)

Members attend annual meetings

(cont from page 10)

Items for discussion at the annual meetings session included increasing the numbers of WCGA membership, increasing participation in the website growers' directory and newsletter advertising opportunities, and generating ideas for better serving the membership. The day concluded with a tour of Lucienne Grunder's Owl Creek Ranch and a reception and dinner overlooking the orchards as the sun set on the stunning California landscape.

Saturday's events included a tour of Robert Gianecchini's six-acre chestnut and walnut orchard with a discussion on the harvesting methods of using a mechanical sweeper and picking up nuts by hand. Gianecchini also discussed plans to phase out his chestnut orchard as a new walnut planting moves into productivity.

At Correia Chestnut Farm in Isleton, members discussed various pollinators, grafting techniques, foliar sprays and fertilization programs. Harvey Correia, WCGA president, discussed his irrigation management in light of the high water table in a portion of his orchard. Harvey also discussed his light crop last year and ideas on improving pollination, including grafting pollinators onto trees located in the upwind portion of the orchard.

The afternoon featured a visit to the University of California at Davis, where Mike Cunningham discussed a chestnut cultivar import project and propagation methods.

The final tour stop at George and Suzette Canfield's Chestnut Leaf Orchard in Winters spurred a discussion of quality across the industry and marketing and packaging strate-

gies. Bridget Canfield said the key to their success is moving the crop quickly. "We don't seek small sales, but larger wholesale business in order to keep the crop fresh and at top-quality," she said.

The Canfields have developed a user-friendly web site designed to educate buyers about the preparation and storage of chestnuts and make it a priority to spend time with retail grocers explaining how to present the nuts in the store. Rustic, embroidered bags are used for packaging the chestnuts to create an overall experience that "romances" the product, said Bridget.

NNGA/NAFEX meeting includes chestnuts as topic

The recent joint meeting of the Northern Nut Growers Association, Inc. (NNGA) and the North American Fruit Explorers (NAFEX), held Aug. 15-18 in Columbia, Mo., included three chestnut presentations in addition to information about pecans, black walnuts and other nut tree crops.

Sandra Anagnostakis, Connecticut Agricultural Experiment Station, presented a talk on nut grafting techniques for chestnuts.* Dr. Michele Warmond, professor, University of Missouri Department of Horticulture and UMCA research collaborator and Dr. Gold presented information on the university's research toward establishing the chestnut industry in Missouri.

Bill Reid, Kansas State University, presented a talk on Black walnut cultivar evaluation. Mark Coggeshall, UMCA research specialist, spoke on the benefits and challenges of growing black walnuts on a trellis system.

The annual NNGA banquet featured the crowning of the "King Nut," recognized each year for contributions to the organization. A group tour of Forrest Keeling Nursery, Elsberry, Mo., and Stark Bro's Nurseries and Orchards Co. in Louisiana, Mo. concluded the meeting on Aug. 18th.

Charles NovoGradac and Debbie Milks, owners of Chestnut Charlie's Organic Produce, Lawrence, Kan., were among a small group of WCGA members attending the meeting. "We appreciated talking 'nuts' with other growers," said Charles. "We value the face-to-face exchanges with other growers -- and as we have always observed, NNGA members are never competitive amongst themselves. We all freely and graciously share our experiences and our lessons."

** Information from grafting presentation available in January issue.*



Ken Hunt, UMCA post-doctoral fellow and nut tree improvement specialist, (second from left) explains the characteristics of cultivars at the Horticulture and Agroforestry Research Farm tour during the NNGA/NAFEX meeting in Missouri, Aug. 15-18, 2004.

Chestnuts in the Press

Below is a listing of articles featuring chestnuts published in newspapers and magazines. A portfolio of these articles can be a useful tool to showcase the appeal of chestnuts to potential customers or at any display, grocer or farmers' market. Please keep us informed of additional articles about chestnuts from your area.

Martha Stuart Living magazine, November 2001: "Chestnuts, From Stuffing to Strudel" by Ray Isle

The Oregonian, Nov. 27, 2001: "Cracking the Case of the Mysterious Chestnut" by Amy Martinez Starke

Kansas City Star, Dec. 25, 2002: "Chestnuts Draw New Interest in Region," by Bill Graham.

Cadillac News, Oct. 16, 2003: "A Historical Perspective on the Chestnut in Cadillac" and "Chestnuts 101: Recipes for Cooking with Chestnuts"

Cadillac News, Nov. 3, 2003: "Cadillac is one of many cities to promote chestnuts;"

The Chamomile Times and Herbal News, Dec. 19, 2003: "Chestnuts: An American Classic Returns" by Leslie Coons; available at www.chamomile-times.com, Issue #20.

The Los Angeles Times, Dec. 25, 2003 (Front page!): "They're All Aglow for Chestnuts" by Stephanie Simon

Kansas City Star, Dec. 26, 2003: "Roasted Chestnuts Offer the Scent of the Season," by Lauren Chapin.

Modesto Bee, Aug. 14, 2004: "More to Chestnuts than Roasting," by Tim Moran.

The NewsJournal, Delaware, Sept. 23, 2004: "Hybrid Chestnuts Restore a Classic to Local Landscape," by Kent Steinriede.



Mike Cunningham, far right, discusses a chestnut cultivar import project and propagation methods in the green house at the University of California-Davis, one of the tour stops at the recent WCGA meeting.

CHESTNUT & HAZELNUT CAKE

1/2 cup mild olive oil
1 cup chestnut flour plus additional for dusting
3/4 cup hazelnuts (3 1/2 oz)
1/2 teaspoon baking powder
1/2 teaspoon baking soda
1/2 teaspoon salt
3 large eggs, separated
1/2 cup mild honey
1/4 cup sugar
Special equipment: a 9- to 9 1/2-inch (24-cm) springform pan

Put oven rack in middle position and preheat oven to 350°F. Oil pan and dust with chestnut flour, knocking out excess. Toast hazelnuts in a shallow baking pan until fragrant and interior of nuts are pale golden, 10 to 12 minutes. Rub nuts in a kitchen towel to remove any loose skins (some skins may not come off). Cool nuts to room temperature and chop medium-fine.

Sift together chestnut flour, baking powder, and salt in bowl, then stir in nuts. Beat together egg yolks, oil, honey, and 2 tablespoons sugar with an electric mixer at high speed until thick and pale, about 5 minutes in a stand mixer or 8 minutes with a handheld. Add flour mixture and mix at low speed just until flour is moistened.

Beat egg whites and a pinch of salt in another medium bowl with cleaned beaters at medium-high speed until they form soft peaks. Add remaining 2 tablespoons sugar a little at a time, beating, and beat until whites just hold stiff peaks. Fold one third of whites into batter to lighten it, then fold in remaining whites gently but thoroughly. Spread batter in pan and rap pan on work surface once to release any large air bubbles. Bake 30 minutes, then loosely cover with foil and bake until a wooden pick or skewer inserted in center of cake comes out clean, 10 to 15 minutes more. (Cake is naturally dark.) Cool completely. Makes 8 servings.

***Gourmet* magazine,
August 2004**

National Chestnut Week is October 10-16 This Year: Buy Early, Buy Fresh!

FOR IMMEDIATE RELEASE

**Contact: Harvey Correia,
WCGA President, (916)777-4152
Date: 9/22/04**

ISLETON, CA. It's never too early to think about Chestnuts. With the holidays coming, and National Chestnut week just around the corner, now is the time for people to buy chestnuts when they are fresh and flavorful-flavors that can be retained with simple storage practices, according to Harvey Correia, President of the Western Chestnut Growers Association (WCGA).

National Chestnut week is October 10-16, and with the large harvest coming in this year, it's the best time to buy. The Western Chestnut Growers Association will honor National Chestnut Week with a variety of promotions and events. Growers are out gathering the nuts, and already are reporting brisk sales as chestnut connoisseurs from around the country hurry to get the best while they're still available.

Many Americans don't realize that the chestnuts purchased in most stores are imported, and that the nut is grown and available fresh in the US. "US-grown nuts are the best tasting because they spend minimal time in transit," Correia explains. Want to know where to buy freshly harvested chestnuts? The WCGA's website features a Grower's Directory where you can locate a grower nearest you: www.wcga.net/directory.htm. The growers also maintain libraries of fax-ready recipes for using fresh and dried chestnuts.

Chestnuts are an unusual nut. Remarkably nutritious, they are receiving recognition as a health food according to several universities, including the UC Davis College

of Agriculture & Environmental Sciences. Sweet in taste, they are traditionally used in the US for eating roasted or boiled. Not only are they used in stuffing, they're a popular ingredient in sweet breads, cakes, soups, stir fry, cereals and ice cream. Europeans prize them as a candied nut, served crushed over ice creams and other deserts.

Like all nuts, chestnuts taste best when freshly harvested. But unlike other nuts, they require proper cool storage to ensure maintaining that fresh taste. "We try to educate both retailers and buyers," Correia says. "Because of their high moisture content, when chestnuts are left sitting in a store bin, they can dry up or even mold. Like fruit, they should to be stored in plastic bags in a refrigerated area, such as the vegetable crisper. This keeps them moist, fresh, and protects them from absorbing the flavors of other foods."

When choosing chestnuts, let your fingers do the testing. Chestnuts should be firm, and not have a musty smell to them. Those that are soft when squeezed have been allowed to dry out, will be less flavorful, and it may make them difficult to peel. Good chestnuts should be attractive and free of any physical damage. Chestnuts range from \$3-\$7 per pound, depending on the size, variety, and region of the country.

First cultivated around 6,000 years ago by the Chinese, the ancient Greeks are believed to have been the first in Europe to grow them. They were an essential part of life, serving as a year 'round food source in an agriculturally-based world. There are four species of chestnuts: European, Chinese, Japanese and American. American chestnuts

cloaked much of the US in pre-European times, and continued to thrive as in important tree and food to Americans until Chestnut blight devastated the trees in the early 1900s. By the 1950s they had virtually been wiped out. Today, most chestnuts grown in the US come from trees that are European, Asian, or hybrids of these.

Today, chestnuts are a growing segment of agriculture. Worldwide production is around 500,000 tons, according to UC Davis. The US produces less than one percent, or less than 500 tons, says Correia. Growers can be found nationwide. Harvest usually runs from September to November, depending on the cultivar and region. A mature tree can produce up to 100 pounds of nuts. Some growers hand harvest, other use mechanical harvesting techniques. Chestnut farms range from just a few acres to 85 acres in size.



**About the
Western
Chestnut
Growers
Association:**
The WCGA
was incorporated in 1996

to promote and educate consumers and retailers about chestnuts, disseminate information to growers and support research in the chestnut industry. The Association has over 80 members nation-wide, many of whose orchards are just beginning to produce on a large scale. The WCGA is growing and welcomes new members from any region in the U.S. For more information, visit www.wcga.net.

If you would like to receive a "Ready for Press" article for your usage and convenience, please contact Harvey Correia at Harvey@chestnuts.us or visit <http://www.wcga.net/>.

Western Chestnut Growers' Assn., Inc.
Minutes of the General Meeting July 16, 2004

Call to order: The meeting was called to order by President Chris Foster at 1:05 p.m. at the AgCredit Building, Stockton, CA.

Secretary's Report: The Secretary indicated that the minutes from the last general meeting had been published in the newsletter and received no comments.

Treasurer's Report: Ray presented a financial report for 2003 calendar year and for the first six months of 2004 (not including income or expenses related to the annual meeting). The balance as of June 30, 2004 was \$6832.76. Chris announced that he, Ben Bole and Mike Reid had conducted an audit of the 2003 income and expenses for the organization and found there to be no inconsistencies.

Unfinished Business: There was no unfinished business.

New Business:

Clothing: Harvey said he felt everyone should purchase a WCGA shirt to help publicize the chestnut industry.

Donation: Carolyn presented a check to the organization for \$85.00, representing the profit from the sale of National Chestnut Week sweatshirts and T-shirts, and suggested that WCGA take on the project as a good money-maker. Mike Gold suggested that TACF be contacted regarding such sales and felt they would be potential buyers.

Bylaws: Ray made a motion to amend the bylaws as proposed in the July 1 newsletter. The amendment (in italics) proposed is for Article VIII, Section 1 as follows:

"A Nominating Committee of three (3) members, no more than one (1) of which may be a member of the board shall be appointed at least 90 days prior to the annual meeting each year to prepare a slate of officers with one candidate for each office. Nominees for officers/directors will be limited to those members in good standing who have been members as of July 1 of the year prior to their election. The Nominating Committee's report and the proposed slate of officers will be made available to the newsletter Editor in time for regular publication prior to the election. Ballots, if required, will be mailed ten (10) days prior to the annual meeting along with the newsletter or mailed separately by the Secretary."

Motion seconded by Harvey. Chris asked for discussion. There was a question about why the amendment was necessary. Ray explained that the Nominating Committee questioned whether it was appropriate to nominate someone who was not a member but who might make a good member of the board. Paul Vossen asked if we would be shutting out a qualified person whose primary position ruled out membership in WCGA, such as a state or federal employee. Chris said he supported the change in language and called for the question. Motion passed.

Marketing: Paul Vossen indicated some organizations come to a point that they step up to a new level of activity - maybe becoming a marketing organization. Chris gave a short his-

tory of WCGA's thinking about marketing activities. Carolyn provided a clear definition of marketing as promotion, not selling, which is what WCGA can do within its bylaws. Paul agreed that is exactly what he meant. Chris said we should be pursuing grant monies. Paul suggested a committee to examine what it is WCGA wants to do or not do in terms of promotion or marketing. Maybe this committee could develop a plan for promotion to present to the membership next year. Mike Gold and Lucienne Grunder volunteered to be on such a committee but neither was interested in chairing the committee. No chair was appointed at this time. Paul said grants can be very productive in promotional activities short term. Long term this association needs to find funding - perhaps a fee based on sales.

Pricing: The question was asked about how growers set their prices. Lucienne wants prices published, perhaps every two weeks, for growers. Harvey did not see publishing prices that could conceivably range from \$1.50/lb to \$7.00/lb as meaningful. Some members were concerned that everyone's pricing would become public, allowing buyers/sellers to use that information in an unfair way. Lucienne agreed to be the collector of pricing from members if that would work. Mike said he'd help on this. Ray suggested we put prices on the Forum and limit access to WCGA members. Paul suggested that WCGA come up with recommended pricing, i.e. wholesale, retail, bulk sales, etc. Chris suggested that maybe pricing is proprietary information. Paul asked how a seller determines price. He said maybe we need to establish a base price as commodity markets do.

Promotion: Chris said we need a new approach to the press release idea. He said he felt we have several thousands of dollars to spend on such an effort. Greg Dabel suggested a 1/8 page ad in Sunset magazine, indicating that his 2-line ad was very profitable. Carolyn said her 2-line ad in that publication got exactly 1 order, and felt it was useless. Fred Hunt suggested ad space in the California Heartland magazine. Another suggestion was to find media produce people - food writers, etc. - to get them to discuss chestnuts as a product to buy. Greg suggested that we may need a name change to better present our image as more than a 3-western-state organization. Several people said Western means western world or western hemisphere.

Election: The slate of officers for 2004/2005 was presented: President, Harvey Correia; Vice President, Lee Williams; Secretary-Treasurer, Ray Young; Directors, Chris Foster, Ken Hunt, Sandy Bole, Lucienne Grunder. Mike Reid to accept the slate of officers as presented. Seconded by Joe Machado. Motion passed.

Adjournment: The meeting was adjourned at 2:10 p.m.
Respectfully submitted,

Ray Young, Secretary-Treasurer

More to chestnuts than roasting

(Article reprint from *The Modesto Bee*, Aug. 14, 2004)

by **Tim Moran**
Bee Staff Writer

WATERFORD -- Yes, chestnuts can be roasted on an open fire. But they are a lot more than a Christmas carol image, according to Lucienne Grunder.

They can be used to make soup, spreads, salad toppings, dressing, deserts, bread and main dishes like chestnut-pumpkin curry and lamb and chestnut stew, Grunder said. You can fatten up suckling pigs on chestnuts and make furniture from its wood.

Grunder is out to sell the American public on the benefits of chestnuts. She has a vested interest in the crusade: her Owl Creek Ranch near Waterford may be the largest chestnut farm in the United States.

The ranch on Claribel Road includes 85 acres of chestnut trees, along with 400 acres of walnuts. The orchards, irrigated with microsprinklers and from wells, look like an oasis in the middle of the arid range land of eastern Stanislaus County.

The idea to plant chestnuts came to Grunder when contemplating what to do with the hilly, gravelly land near her walnut orchards at Owl Creek Ranch.

She remembered that the chestnut trees in her native Switzerland grew in the worst terrain, and decided to give them a try.

A potential market for domestic chestnuts seemed to be there: The United States imports \$30 million to \$40 million worth of European chestnuts annually, according to a recent article by Malinda Miller of Ag Marketing Resource Center at Iowa State University.

U.S. chestnut production is less than 1 percent of the total world production, according to Miller.

The California climate is ideal for

chestnut trees, Grunder said, because they thrive in hot, dry weather. European growers battle mold and diseases that come with rain, she said.

Grunder is a director of the Western Chestnut Growers Association, which has about 60 members, mostly in Washington and Oregon.

Rancher getting the word out

Joe Avila of Modesto is one of them. Avila has six acres of chestnut trees on his Albers Road ranch, which he calls The Chestnut Farm.

A native of the Azores, Avila remembers picking up chestnuts on his grandmother's property as a boy. On holidays, the family would have boiled chestnuts as a special treat, he said. That memory prompted him to plant 30 trees about 20 years ago, and he has been adding to the orchard ever since. Like Grunder, Avila says marketing chestnuts is a matter of educating the public about them.

"It's kind of a novelty thing. I do a lot of farmers markets," he said.

The nuts are harvested in September and October, but the public thinks of them as a Christmas treat, he noted. "They are familiar with the song, but they have not seen them," he said.

Immigrants from Europe and Asia are familiar with them, Avila said, and know how to fix them in different ways. His regular clients include Italian, Korean and Portuguese immigrants, he said.

Grunder and Avila offer recipes to the public to build interest in chestnuts.

Growing chestnuts commercially is labor intensive, Avila said. The chestnuts grow in a spiky hull, a bit smaller than a tennis ball, which must be removed. Then a thin hard shell must be peeled off. Chestnuts require cold storage and are susceptible to mildew if they get damp, Avila said.



"It's a lot of fun, but a lot of work," he said.

Grunder hopes to build up a big enough local chestnut industry to form a cooperative that could purchase a machine to peel chestnuts, similar to area almond hullers.

Her Owl Creek Ranch operation was at an awkward stage last year, too large to sell entirely through farmers markets and not big enough to ship to the East Coast, Grunder said.

The nursery she set up to get her trees started turned out to be the most profitable part of the chestnut operation, she said, selling trees to other growers.

But the key to growing the industry is convincing farmers and consumers of the benefits of chestnuts, Grunder said. Those benefits go beyond the nuts themselves. Chestnut wood makes beautiful furniture and construction beams, and it is insect resistant, Grunder said.

She is contemplating planting a grove of chestnut trees very close together, for wood. But it takes about 60 years for the trees to be large enough to harvest for wood.

Her grandchildren would be the beneficiaries of that project, Grunder said.

In the meantime, the chestnut harvest is about a month away, with the holidays to follow. If the regional air quality board cooperates, valley residents could even roast them on an open fire this Christmas.

Bee staff writer Tim Moran can be reached at 578-2349 or tmoran@modbee.com.



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