

WCGA Board Makes Plans For Northwest Annual Meeting and Local Orchard Tour

Make your plans today to attend the WCGA Annual Meeting and orchard tour Saturday and Sunday, June 28-29, 2003. The location of the business meeting and presentations is the CASEE Center (Center for Agriculture, Science and Environmental Education) in Brush Prairie, WA.

Chris has planned some exciting and worthwhile presentations that members will find of interest. Laura Barton, Trade Manager for the Oregon Department of Agriculture, Development and Marketing Division, will be speaking on developing a market for chestnuts. Ken Hunt and Mike Gold on staff at the University of Missouri's Center for Agroforestry will be speaking on the work being done at there to establish a chestnut industry in that area. Chris Foster will be talking about post harvest handling and storage techniques, and Lucienne Grunder will discuss the early results of the varietal trials she has conducted at her orchard.

There will be visitations to four orchards; three of them have not been visited by the organization previously. Hong Choi will host a pruning demonstration, Ray and Carolyn Young will discuss management techniques of their 4-year-old orchard with demos of some of their DIY equipment. Chris Foster will discuss the management of his organic orchard, and Ben and Sandy Bole will discuss their processing techniques.

This is a meeting you won't want to miss. A reservation is included on p. 5.

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MU Agroforesters Believe a Bright Future May Rival the Chestnut's Glorious History

by Forrest Rose
as published in the U of M CAFNR News
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A little more than a century ago, native chestnut trees dominated the hardwood forests of eastern North America and provided townsfolk and settlers alike with a ready source of food, timber and other valuable commodities.

"They used the bark to tan leather, and the wood provided strong, rot-resistant timber," said Michael Gold, University of Missouri associate professor of forestry. "Chestnuts were an important food source in colonial times."

"When chestnuts are milled, it's similar to corn meal, only a little sweeter," said Ken

can produce at least a ton per acre per year. And they will produce heavily for at least two decades, and probably a lot longer."

Hunt started growing nut trees almost 20 years ago "as a hobby," he said. He had pecan and Eastern black walnut trees, both native to Missouri, as well as chestnuts. "I realized the chestnuts do really well here."

He discovered that the chestnut trees will bear nuts in as little as five to seven years, while pecans cannot be harvested until the tree is at least 10 years old. Hunt's pecan crop was also plagued by what he

"We feel that under good management, chestnut trees in Missouri can produce at least a ton per acre per year."

Hunt, research associate at the MU Center for Agroforestry. "They even used to fatten their hogs on free-range chestnuts."

Sometime in the late 1800's, a blight accidentally imported from Asia took hold of the American chestnut, and "it was the same scenario as the Dutch elm blight," Hunt said. "It spread very rapidly." By 1950, the blight had wiped out the chestnut forests of the United States, and chestnuts were no longer common fare on American tables.

"About the only thing left today," Gold said, "is the line of the song."

Research is under way to restore the American chestnut, and Gold is confident that in time, blight-resistant trees will once again be found in the eastern forests. But the stately spreading chestnut trees of the Longfellow poem might not be seen for many generations.

Hunt and Gold, however, believe there could be a bright future in chestnuts for Midwestern growers. At the MU Horticulture and Agroforestry Research Center (HARC) in New Franklin, Mo., they are experimenting with blight-resistant Chinese chestnut cultivars for nut-cropping - with promising results.

"Our focus is to grow chestnuts as an orchard crop," Gold said. "We feel that under good management, chestnut trees in Missouri

calls "critter problems," unlike his chestnuts. "Since they're in a spiny burr, the birds and squirrels usually leave them alone."

Hunt soon found the Chinese cultivars did better in Missouri than the European chestnut cultivars favored by many nut croppers on the west coast. "The Chinese cultivars are more or less completely resistant to the blight," he said. "And China has a climate similar to the Midwest, so they can tolerate our cold winters and hot summers."

Seven years ago, Hunt started growing grafted chestnuts at HARC, and today there are more than 50 Chinese chestnut cultivars. "For the last three years, I've been getting a harvest," he said. "It's not that big, but it's enough to give us information about the cultivars."

He and Gold selected the three cultivars that showed the most promise and established experimental orchards at HARC a year ago, with the aim of testing the trees' response to different pruning and fertilization regimens.

Even if the trees thrive and produce abundant nuts, that's only the first step in making chestnuts into a profitable crop, Gold said.

See *Chestnut Future at MU*, p. 7



A MESSAGE FROM THE PRESIDENT

In this issue, our Editor has selected some articles that hopefully will get you thinking about some of the more technical aspects of growing and handling of chestnuts. In a similar way, some of us are hoping to build our Annual Meetings into a place where growers will come together to learn, find out about what's going on elsewhere, share experiences, and make progress in areas that benefit growers in general, rather than just individuals. Please consider attending the WCGA Annual Meeting in the Greater Portland area, June 28 - 29. A registration form is included in this issue.

In such a peculiar field as producing chestnuts, one should never underestimate the value of what you might come across by exchanging information, reading, or listening to the experiences of others. Little may be applicable to your approach or situation, but just one thing learned can make a tremendous difference. Sometimes we forget the value of what we put to memory. For the time being, western growers need to be aggressive in seeking out and gleaning information. We also need to be pro-active in shaping our common market future. We simply don't have the kind of university and scientific support found in other parts of the world. You may need to become the "expert" yourself. A simple tip you learn from this organization or elsewhere may save countless hours or years of experimenting, not to mention a pile of money.

Programs are underway in Michigan and Missouri specially designed to assist Mid-West growers and their marketing efforts. With the help of Michigan State University, over \$250,000 in grants have been put to work building an industry in that region. Nothing of that sort has emerged yet in California, Oregon or Washington, though actual West Coast production far exceeds other regions of the Country. A healthy and vital WCGA may offer some encouragement to get things moving here.

Finally, some of you may be aware of the International Chestnut Symposium coming up this fall in Portugal. This is largely a meeting of the scientific community with grower attendees being somewhat of a rarity. If you have a certain "scientific bent" and think you might be interested, I would suggest you first have a look at the Proceedings from the last Symposium in 1998. A list of the papers that were presented can be found on the internet at : <http://www.actahort.org/books/494/index.htm>. Much of what goes on at these meetings is not applicable to western growers or growers in general, but you may find the topics interesting anyway, and the whole event a rich cultural experience. A few growers from the West will be there. I would expect you'll find a report in a future newsletter. The WCGA will be making its presence known at this event. A "volunteer" entry in a poster session is in the planning stages. For those of you that might want to stay closer to home, you might consider the NNGA meeting to be held at Michigan State University in July. The focus is again likely to be chestnuts, with lots of practical information for growers.

Christopher H. Foster

EDITOR'S NOTES

As chestnut growers we all recognize the fact that we're ascending the learning curve in terms of what we should be doing to maximize both production and quality of our crop. What works in one area may not work in another and there may be more than one way to approach each problem. It behooves us to listen, to evaluate and to be open to new ideas. Sometimes the "I've always done it this way" approach is not the best.

I was recently privileged to attend a seminar by Robert Hutchison, D.V.M., probably the leading expert in canine reproduction in this country. He started by saying, "Thirty percent of what I told you 10 years ago was a lie. Thirty percent of what I'll tell you today is probably a lie -- we just don't know which 30%." Obviously he was being provocative but his point was well taken and it may not be much different in chestnuts. As knowledge increases and technology improves, things we do today may prove fallible. We need to be ever open to new ideas.

Carolyn

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POSTMASTER

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

ADVERTISING RATES

- Full page, camera ready (w/1 photo) .. \$20.00
- Half page, camera ready (w/1 photo) ... 15.00
- Quarter page 10.00
- Business card (4 issues) 15.00

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. If ad is cancelled, money may be refunded if space is resold. Make checks payable to Western Chestnut Growers Assn., Inc.

All ads and other copy preferred in PC format on disk or email to Carolyn@ChestnutsOnLine.com. Ads must adhere to published ad sizes for space purchased. Call for specifics. Otherwise for best results, submit original photographs. Layout of ads will not be done until payment is received. **Send materials to P.O. Box 841, Ridgefield, WA 98642, or Fedex/Express Mail to 29112 NW 41st Ave., Ridgefield, WA 98642.** Call for further info.

PUBLICATION AND DEADLINES

- Fall issue deadline 9/10 mailed 10/1
- Winter issue deadline 12/10 mailed 1/1
- Spring issue deadline 3/10 mailed 4/1
- Summer issue deadline 6/10 mailed 7/1

EDITORIAL OPINION

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Diaporthe Nut Rot Disease of Chestnuts in New Zealand and Australia

By Harvey C. Smith

Chestnut Nursery and Research Scientist, PO Box 37075, Christchurch, NZ

Reprinted here with permission from "Health in a Shell", Issue No. 49, Summer 2003

Introduction

Chestnut growing in New Zealand has been seriously hampered by the disease previously called *Phomopsis* nut rot. This disease has caused serious losses in the main chestnut growing area of the Bay of Plenty and the Waikato (particularly in export shipments) in recent years from orchards that have been established for over six years.

This disease has also been reported previously in Australia where the industry has been established for at least 10 years longer than New Zealand. Growers there experienced the same increase in disease in mature orchards (established longer than six years) and also in seasons and districts which had higher rainfall, particularly about flowering time. The Australian growers funded research at Government laboratories and field trials in Victoria. The researchers found that there were several fungi associated with nut rot but the main one appeared to be one which they called *Phomopsis castanea* based on spore produced in culture or on the rotting nuts after harvest. The Australian research also showed that there was a fungus inside the trees growing as an endophyte which researchers thought was the same as the nut-rot fungi. The researchers concluded that the main method of nut infection was internally by the fungus moving from the fruiting branches through the burr and into the nuts. They did not find any air borne spores or other stages of the life cycle of the fungus and decided that the best control method would be by selecting resistant varieties. To my knowledge this has not yet been successful and apparently there is very little research on this disease at present.

Research in New Zealand has been funded by the NZ Chestnut Council over the years between 1997-2000 but this has also yielded a lot of information but has not yet resulted in successful control measures. This research was initiated by Dr. David Klinac. Prof. D. McNeil and Dr. Wadia Kandula reported that the fungus should be called '*Diaporthe castanea*'. It was isolated from all parts of the trees and was widespread throughout New Zealand in all varieties.

The research described on the next page was conducted on a commercial chestnut

orchard and nursery in Canterbury. The nursery was started in 1987 (after removing an apple orchard) and the orchard planted in 1990 and 1992. The first nut crops harvested from 1995 to 2000 had very little nut rot, but nut rot increased from zero in 1995 to 30% in 2001 harvest. By 1998 it was realized that the disease was increasing and it would become a serious disease in Canterbury, especially when there was wet weather during chestnut flowering.

This suggested that the main infection of the chestnuts was probably coming from airborne fungal spores previously never reported by researchers in Australia or New Zealand.

Abstract

The results from my own laboratory and field research have shown:

1. Chestnut nut-rot disease can be caused by airborne spores of the fungus '*Diaporthe nux*'. This fungus has previously been called *Phomopsis castanea* and the disease called "Phomopsis" rot of chestnuts although there are at least two different fungus species which cause significant loss in chestnuts.
2. It has now become apparent that these two, '*Diaporthe nux*' and another tentatively named '*Discula*' are the only fungi causing serious economic losses. In the past these two fungi have been considered together as only one species '*Phomopsis castanea*' because they both have the same size and shaped pycnospores.
3. The '*Diaporthe*' fungus that I have recently discovered causing nut rot, has not previously been correctly named and identified as causing nut-rot but it is the same fungus which is the endophyte which lives in the woody tissues of chestnut (and probably other species of trees and woody plants also) without causing any obvious symptoms of infection.
4. Although the fungus has previously been called *Phomopsis castanea* in Australia and New Zealand, I have been able to prove by inoculation and re-isolation that the '*Diaporthe*' fungus is a new species and the correct name for the disease should be '*Diaporthe Nut-Rot*'.

It is the same fungus that is usually a common inhabitant inside the woody parts of the chestnut tree and causes no harm to the tree apart from being able to cause nut-rot.

5. The complete cycle of inoculation starting from ascospore cultures on agar then to sterilized chestnut twigs which formed pycnidia slowly and later produced abundant alpha conidia and stylospores after four weeks. Then after a further four weeks in high light near a window and a final four weeks outside at temperature between -5 and 14 degrees C, they formed abundant perithecia on a black stroma and short to medium black ostiole beaks and masses of ascospores inside asci. This completed the full life cycle required to prove the genus '*Diaporthe*' to be the correct name.

Although the ascospores of this fungus have already been proved to cause nut rot when inoculated into the nuts, it is still necessary to find what are the main natural methods by which this fungus enters the nuts and what are the most favourable conditions for infection.

The most likely method of infection however, is by the airborne ascospores released during rain at flowering and by rain splashed ascospores after the nuts fall to the ground.

The other nut rot fungus '*Discula*' which has also been studied in Australia and at Lincoln University, produces abundant pycnidia very quickly (between two to ten days) and abundant pink pycnidiospores. (This other fungus will be described in the next article).

These rain splash pycnidiospores also were found inside naturally infected chestnuts. Pycnidia and spores were found abundantly only on the nuts inoculated with the '*Discula*' isolates, but never on nuts inoculated with the ascospore cultures from '*Diaporthe nux*' (the proposed new name).

The airborne spore stages of the '*Discula*' fungus has not yet been identified or tested for its ability to cause nut rot, but this research is in progress now.

This discovery of infective airborne spores of the '*Diaporthe*' fungus is of major importance because it should result in improved methods of control and a consequent increase in yield particularly in the wetter districts and in wet seasons which favor the disease.

The '*Diaporthe*' stage with airborne ascospores has been found on old chestnuts
See *Diaporthe Nut Rot*, p. 7

NZCC Recommendations for Fresh Chestnut Handling and Storage

by David Klinac

Reprinted with permission of the author

Most NZ chestnut orchards are harvested by hand, chestnuts are then dipped in a weak solution of sodium hypochlorite then packed into plastic bags ready for coolstorage at 0-2° C. Recent research has identified an improved chestnut sterilant and storage treatments which result in substantially improved nut quality for our customers.

Sodium hypochlorite is a good, safe and commonly used surface sterilant but it breaks down quickly in contact with organic matter and, even when working well only eliminates some surface fungi: not internal rots, not latent infections under the shell, and not all resting-spores. There are now better surface sterilants and better washing procedures we all need to be using.

Similarly with plastic bags. Getting fresh nuts into plastic bags as quickly as possible after harvest has the great virtue of minimising water loss and maintaining weight: an important consideration when you're being paid by weight. But chestnuts that are "too fresh", with too high a moisture content and surface wetness, are a target for fungi rots. Wet chestnuts go rotten much faster than drier nuts.

The definitive French chestnut handbook "Chestnuts and Marrons" authored by Dr. Henri Breisch (extracts of which appear in "Chestnut News" by permission) is quite clear on this point. A typical, freshly harvested chestnut, at 58-67% moisture content is simply "too wet for successful storage". The "ideal water content" is considered to be 50-52%. To reach this point may require some deliberate drying. At the very least there should be no surface water or dampness. Putting fresh nuts into plastic bags is sometimes just asking for trouble (especially if either sweating or condensation occurs, inside the bags).

Good coolstores, even when running at the correct temperatures can also cause problems. To avoid sweating and condensation good air movement and ventilation is required. This is necessary to prevent fungal growth. Large volumes of tightly packed bags of chestnuts can work against this. Lots of in-and-out movement, frequent restacking, removal of bags of nuts and their later return to coolstorage, and the presence

of rotten nuts in some bags doesn't help. It commonly takes up to seven days from time of admission for a consignment of nuts to drop to stable coolstore temperatures which, even then, have averaged 2-3° C, (allowing rots to continue to develop) even though the coolstore itself has been set to run at 0-1° C. Conversely, nuts removed from coolstorage, even for a short time, can warm up very, very fast (and be much, much slower to cool down again).

Ironically, it can sometimes be easier for even small growers to store chestnuts, for long periods, using only modest resources,

Using the correct cool storage conditions it's possible to store chestnuts for over 18 months.

far more successfully than larger commercial coolstore operators. Using the correct cool storage conditions it's possible to store chestnuts for over 18 months. Sure they lose some weight and some chestnuts germinate but the incidence of surface mould is negligible, and the incidence of internal rots is no higher than when they first entered the coolstore. They are still perfectly OK to eat. So it can be done.

General Guidelines:

1. Whenever possible, put only good quality nuts into coolstorage. (Even the best handling and storage conditions in the world won't stop a nut that is already rotten, going rotten). Even a small percentage of "bad" nuts can jeopardise the storage life of an otherwise good batch: respiration rates will be greatly increased, water loss (and therefore condensation and sweating) will then be increased, and fungal (or bacterial) infections can then spread. There may even be localised heat build-up. To prevent this means washing and dipping nuts, throwing away all "suspect" nuts and if possible use flotation grading (see below). (Ideally

this should be done twice: once on the orchard and again, in the packhouse, just before export or processing).

2. In general, the drier the chestnut the better it will store. This doesn't mean drying the nut so as the shell and kernel are soft to touch (many nuts at this stage are "dead", and this can make storage problems much worse) but certainly a nut that is bone-dry to the touch, with no sign of sweating or condensation during storage is preferable. If you want your chestnuts to store well, be prepared to accept some weight loss.

3. In general, the colder the temperature the better the chestnut will store. Just a few degrees can make all the difference to fungal growth, especially *Phomopsis*. 2-3° C is way too high. Below ~ -2° C is too low due to the risk of freezing damage. (If you want to freeze them, then freezing as fast as possible, which usually means using very low temperatures, minimises damage to the actual nut and helps maintain quality). "Just a little bit of freezing" can be the worst of both worlds giving only partial protection and causing marked deterioration in subsequent taste, texture, colour, etc.

The following three principles have been successfully put into practice by individual growers such as Ray Knowles and commercial companies such as Kiwi Chestnut Co-operative Company Ltd (KCCCL).

KCCCL now uses a new washing and dipping procedure involving "Vortexx", a hydrogen peroxide-based chemical which HortResearch has shown to be much more effective than the previously used sodium hypochlorite. Vortexx is much longer-lasting and more acceptable for organic production. (Like any such chemical it also works best on nuts that have first been washed and rinsed to remove excess dirt, grass and other debris). More detailed information about this chemical and how best to use it is available from David Klinac, HortResearch or John Free, KCCCL, Ph. 07-826-3648 or frees@ihug.co.nz, or the manufacturers Craig Scoun, Ecolab Ltd, Ph. 02-544-4994.

Growers who supply packhouses are now required as part of their supply agreements to use this product in association with on-orchard flotation grading of their chestnuts to remove as many rotten and suspect nuts as possible prior to coolstorage. This technique is both simple and very effective, but needs to be done properly. The water solution must be adjusted regularly for different batches of chestnut. It won't work if

See *NZ Storage*, p. 9



Western
Chestnut
Growers
Association

WCGA ANNUAL MEETING

Saturday & Sunday, June 28-29, 2003

at the Center for Agriculture, Science and Environmental Education
(The CASEE Center)

11104 NE 149th St., Brush Prairie, WA

Saturday

9:30 A.M. Activities begin at the CASEE Center

- Registration and Welcome -- Coffee, tea and goodies
- Laura Barton, Oregon Dept. of Ag., Development and Marketing Division, Trade Manager
- Drs. Ken Hunt and Mike Gold, University of Missouri, Center for Agroforestry, "Growing Chinese Chestnuts in Missouri"
- Chris Foster, Cascadia Chestnuts, Portland, OR, "Post Harvest Handling and Storage Techniques"
- Lucienne Grunder, Owl Creek Ranch, Waterford, CA, "Early Results of Varietal Trials at Owl Creek Ranch"
- There will be a catered lunch at the noon hour

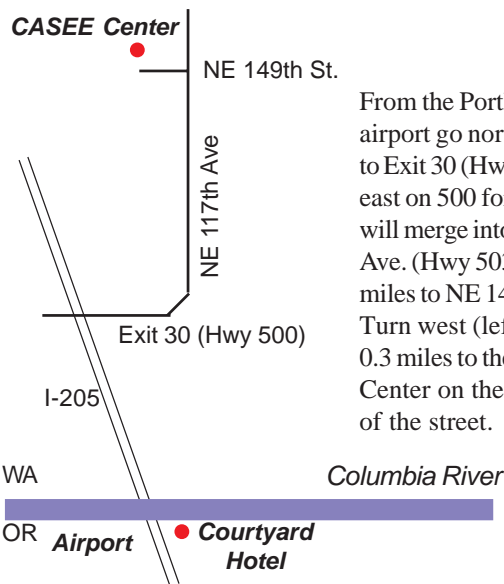
2:00 p.m. Orchard tours begin

- Hong Choi orchard in Amboy, WA -- Pruning demonstration
- Allen Creek Farm (Ray and Carolyn Young), Ridgefield, WA, "Managing the young orchard from planning to product"
- Catered dinner at Allen Creek Farm

Sunday

- Ladd Hill Orchards (Ben and Sandy Bole), Sherwood, OR "Processing chestnuts from orchard to market"
- Lunch (order off the menu) at the Cornelius Pass Roadhouse
- Cascadia Chestnuts (Chris Foster), "Organic management techniques, field grafting, and varieties"

Directions



From the Portland airport go north on I-205 to Exit 30 (Hwy 500). Go east on 500 for 0.6 mi. It will merge into NE 117th Ave. (Hwy 503). Go 4.3 miles to NE 149th St. Turn west (left) and go 0.3 miles to the CASEE Center on the north side of the street.

Where to Stay

Courtyard by Marriott
11550 NE Airport Way
Portland, OR 97220
Phone: 1 503-252-3200
Ask for Sr Rate or AAA

or **If you have a trailer or RV you are welcome to park it at the Young's -- power & water hookups**

WCGA Clothing

Clothing with the WCGA logo will be available for order at the meeting.

Raffle

There will be a surprise raffle that you won't want to miss. If you have something you'd like to donate to the raffle bring it with you and add to the fun.

Questions? Contact Chris Foster, 503-621-3564 or via email at foster@europa.com or check out the WCGA website at <http://www.wcga.net>.

Cut here and return this form with your check for \$45.00 per person (members) or \$55.00 per person (non-members) made payable to WCGA, Inc., to Ray Young, Treasurer, PO Box 841, Ridgefield, WA 98642. **DEADLINE FOR RESERVATIONS IS MONDAY, JUNE 23.** Participation is limited to 40 people except for the business meeting and includes lunch and dinner on Saturday.

Name(s)

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If you would like confirmation of receipt provide your email address or send SASE.



WCGA CLOTHING ORDER

Here's another opportunity to promote the Association. The following clothing items are available with the new logo for association members.

Please complete the order form and mail with your check payable to WCGA, or VISA/Mastercard number to Sandy Bole, Ladd Hill Orchards, 15500 SW Roberts Rd., Sherwood, OR 97140 or Fax your order to 503-625-1937.

Item No.	Description	Sizes available	Colors available	Unit price
K420	Pique Knit Short-sleeve Polo Shirt	Unisex sizes XS-4XL	White, Ivory, Oxford, Stone, Yellow Faded Blue, Red, Faded Olive, Burgundy Forest Green	\$34.00
K420P	Pique Knit Short-sleeve Polo Shirt w/Pocket	Unisex sizes XS-4XL	White, Stone, Faded Blue	\$38.00
L420	Ladies Pique Knit Short-sleeve Polo Shirt	Sizes S-XL	White, Stone, Yellow, Faded Blue, Red	\$34.00
PC61	Men's/Women's Cotton Knit T- Shirt	Sizes S-2XL	White, Ash, Yellow, Natural, Stonewashed Blue, Stonewashed Green, Violet, Colonial Blue, Red, Spruce	\$16.00
SP10	Long-sleeve Denim Shirt	Sizes XS-4XL	Faded Blue	\$31.00
SP11	Short-sleeve Denim	Sizes XS-4XL	Faded Blue	\$31.00
L600	Ladies Long-sleeve Denim Shirt	Sizes S-XL	Faded Blue	\$34.00
83062	Crewneck Sweatshirt 80/20 Cotton/Poly	Adult sizes S-2XL	Ash, Heather, Bluegrass (slate blue), Wine	\$46.00
CP82	Brushed Twill Baseball Cap adj. closure		Khaki, White, Red, Royal	\$15.00
AP34	Butchers Apron 34" long		White, Vanilla, Butter, Sage, Hunter, Red, Royal	\$19.00

Note: All items are 100% cotton, unless otherwise noted.

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Credit Card No:	_____			Expiration Date: (Mo/Yr) _____		
Signature: _____						
MAIL YOUR ORDER WITH CHECK ENCLOSED PAYABLE TO WCGA TO SANDY BOLE, LADD HILL ORCHARDS, 15500 SW ROBERTS RD., SHERWOOD, OR 97140, OR FAX IT WITH CREDIT CARD INFO TO 503-625-1937.						

1/03-10/03

Chestnut Future at MU, cont'd from p. 1

"We have to create a market demand. People around here just don't know about them."

The existing U.S. markets for chestnuts are made up of ethnic Asians and southern Europeans - people from areas where the chestnut has never lost favor as a foodstuff.

"Historically, in Europe it was pauper food," Hunt said. "You've heard of porridge? Well, porridge was basically chestnut meal. It was the major source of carbohydrates in the European diet until wheat came along."

In these health-conscious times, chestnuts are beginning to come back, Gold said. "Nutritionally, it's more like a grain than a nut. Some people call it 'The un-nut.'" The chestnut has by far the lowest fat content of any cultivated nut, and its subtle flavor and soft texture make it an ideal ingredient in many recipes.

"You can candy it, and it's almost like a sweet potato," Hunt said. "You can add it to pancakes and waffles, or you can go the dessert route." Gold has saved "the only copy I ever bought" of Martha Stewart Living magazine, an issue with a cover blurb that reads: "Chestnuts - From Stuffing to Strudel."

There is also a market for honey from the chestnut tree blossom, he said. "That honey sells for a premium price," Gold said. He and Hunt hope to see beehives established near the stand at HARC this spring.

"It's considered gourmet and health food now," Hunt said. "It's definitely not porridge."

p p p

Diaporthe Nut Rot, cont'd from p. 3

and on old prunings and dead branches on the ground, from the Waikato to South Canterbury, and is likely to be present all over New Zealand. It has also been found on grapevines in Australia.

The studies on the identify of the 'Diaporthe' fungus have been largely completed. It is a completely different 'Diaporthe' species from those present in Japan and recorded in northern Europe on chestnut trees.

This present study however has shown that this 'Diaporthe' is almost certainly causing nut rot disease in Australia.

It is probably also the same as the nut-rot disease in Italy called 'Mummification disease'. The fungus has been called *Phomopsis*

94th Annual NNGA Meeting to Highlight Chestnuts

"YES! MICHIGAN" ...will host the 94th Annual Meeting of the

Northern Nut Growers Association at the Kellogg Hotel and Conference Center for Continuing Education on the campus of Michigan State University in East Lansing. Located in the middle of Michigan's Lower Peninsula, the meeting site is perfectly situated for a wonderful meeting combined with great vacation opportunities. A busy agenda awaits nut growers, spouses and children alike. Events to educate and entertain nut growers and their families are planned.

There will be tours of local chestnut orchards including the farm where the famous Italian chestnut peeler has been installed, and Dennis Fulbright, meeting coordinator, even promises a chestnut cookoff! This is a day set aside for you to explore the fresh peeled, vacuum packed frozen chestnut. Recipes and ingredients will be provided. A bus has been arranged to take you from the Kellogg Center to the MSU Food Science Laboratory where a dozen stoves, ovens, sinks, pots and pans and a group of young men, who will tote and fetch for you, will be waiting. If that is not enough, your building houses the famous MSU ice cream store. You will have enough time and chestnuts to prepare one or two recipes. Price includes bus rides, liquid refreshments, chestnuts, ingredients for cooking, kitchen usage and labor. Bring \$2.00 for each ice cream cone you will eat!

The 94th Annual NNGA Meeting will begin officially Sunday, 13 July 2003 and end 16 July 2003; however, many members will begin arriving on Saturday, 12 July 2003, primarily to attend the board meeting. All are welcome to come and see how NNGA is run. The regular annual meeting of the board will begin at 1:00 p.m., Saturday, 12 July 2003, a change from previous years, and resume at 9:00 a.m. on Sunday, 13 July 2003.

For more information contact Dennis Fulbright, Department of Plant Pathology, 164 Plant Biology Building, Michigan State University, East Lansing, MI 48824-1312. Office: 517-353-4506, Lab: 517-353-2040, Fax: 517-353-9704, Cell: 517-819-1043. Email: fulbrig1@msu.edu.

**Reservations for the WCGA Annual Meeting to
be held June 28-29
must be in by Monday, June 23rd.
Do it TODAY!**

viterbensis, *P. endogna* and *P. castanea*. The disease is also in Chile where it is presently called *Phomopsis castanea*.

Now that this fungus has been identified with a prolific airborne spore stage, there are major implications in the control measures which need to be taken to reduce its effects on the chestnut industry in New Zealand.

Acknowledgements

I am deeply grateful to Dr. David Klinic of Hortresearch CRI Hamilton, Dr. Wadia Kandula of Lincoln University, Dr. Peter Johnstone of Landcare CRI Auckland and Dr. Ian Pascoe of the Institute of Horticultural Development, Knoxfield, Melbourne, Vic, Australia for their help and suggestions on the research that I have conducted over the past 9 months. I have also

learned a lot about the chestnut industry and the nut-rot problem in Australia from Mr. David Ogilvy of "Brittlejacks", Orange, NSW, Australia.

Information about the author

Dr. Harvey C. Smith is still a research scientist working on fungal taxonomy and on plant pathology. He was Director of the Crop Research of the D.S.I.R. NZ until retiring in 1983.

He then started a consulting practice in Agricultural research until 1990 and then developed apple and a chestnut orchard. He has recently installed a small laboratory for plant research.

About the New Zealand Chestnut Council

For further information about the NZCC you can go to their website: www.nzcc.org.nz

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Freeze Damage in Walnuts

by Wilbur Reil

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Winter kill in walnuts usually occurs in the late fall or early winter on young, vigorous walnut trees that continue to grow late in the fall. On the first or second night in the fall when the temperature drops to about 28° F or lower and frost occurs, trees that are not hardened properly can sustain injury. Damage has the appearance of sunburn and will occur mainly on the south or west sides of the tree. White latex paint has been used to prevent sunburn on trees for many years. A replicated experiment was established to compare the effect of painting walnut trunks to a height of about 7 feet with white latex paint and then comparing the results to unpainted trees. Approximately half (46 percent) of the trees that were not painted showed some damage to the tree. Thirty-six percent of the trees showed damage on the trunk below a 6 1/2-foot height. The trees that were painted eight days following the freeze only had damage to 18 percent of the trees, and only 8 percent of the trees had damage that extended below 6 1/2 feet on the trunk.

These trials demonstrated that painting the trunks and scaffolds on walnut trees shortly after the trees were injured from suspected winter kill can prevent some damage and reduce the severity of damage.

Objectives

Winter kill in walnuts usually occurs in the late fall or early winter on young vigorous walnut trees that continue to grow late in the fall. The tissue seems not to be fully hardened. It can also occur to trees that are very dry, even though the growth of the trees was terminated well before fall. We normally recommend that irrigations occur until sometime in September and then be stopped to allow sufficient time for all growth to stop and the terminal to harden before late October. In mid to late October, an irrigation can then be applied that will provide moisture to the tree, keep the leaves from becoming too dry and dropping, and prevent winter kill from occurring. The tree will not start to grow in late October if it was properly hardened. The leaves will continue to provide tree nutrition and the trunk and roots continue to expand even after the terminal growth has stopped. If temperatures below 32° F decrease gradually in the fall with a few nights at 32°, or slightly below, the tree seems to become acclimated and

able to then withstand temperatures in the low 20's or below. On the first or second night in the fall when the temperature drops to about 28° F or lower and frost occurs, trees that are not hardened properly can sustain injury.

The first injury noted is a slight darkening of the cambial tissue on some of the small- to medium-size wood. It is necessary to cut through the bark to note the damage. As the winter progresses, the bark takes on a darker color. This has the appearance of sunburn and will occur mainly on the south or west sides of the tree limbs. Limbs slanted to get more direct exposure to the sun's rays are more damaged. Even with winter tem-

... the damage stopped
where the tree was painted
or within one half foot of the
painted area ...

perature highs in the 60's, damage gradually becomes more pronounced. By spring when the trees leaf out, some of the branches are completely dry and dead. Other branches and the trunk generally leaf out with the buds on the north and east leafing out higher on the trunk than on the side facing the sun.

New plantings primarily of Chandler, Howard and Tulare have been impacted the past few years by winter kill. These varieties may be more susceptible, or perhaps farmers are trying to maximize growth of the young trees by fertilizing and irrigating late in the fall; I believe that both may be involved.

All three varieties are late leafing, with Tulare being the most vigorous variety of the three. The Tulare variety seems to grow very vigorously late into the fall and has reported more serious damage by winter kill than the other two varieties. I have seen serious damage on all three varieties.

White latex paint has been used to prevent sunburn on trees for many years, I have been told that it may help on winter kill but have not seen it reported or seen data to

prove that it is beneficial. Also, if it is beneficial, the question arises as to whether it needs to be painted before the frost or if it can be applied after the event. These experiments were conducted to evaluate if white paint applied to the trunk after the winter kill event may provide some control.

Approximately half (46 percent) of the trees that were not painted showed some damage to the tree. Thirty-six percent of the trees showed damage on the trunk below a 6 1/2-foot height. The trees that were painted eight days following the freeze only had damage to 18 percent of the trees, and only 8 percent of the trees had damage that extended below 6 1/2 feet on the trunk. There were fewer trees damaged that were painted, even though most of the trees were 10 to 12 feet tall and the painting only extended to approximately 7 feet.

Procedures

On the morning of Nov. 13, 2000 the temperature in several local walnut orchards dropped to 26° F. The previous night there was a light frost but there had been no freezing weather before Nov. 13. Two days following the freeze, darkening cambium tissue was seen on some of the trees in some young orchards. A replicated experiment was established to compare the effect of painting the trunks of walnut trees to a height of about 7 feet with white latex paint, and then comparing the results with unpainted trees.

The 2-year-old Tulare orchard was grafted on Northern California Black walnut rootstock. Approximately half of the trees had not reached 6 feet the first year and were cut back to four healthy buds the preceding winter. In 2000, these trees grew vigorously reaching a height of 10 to 12 feet.

These trees were selected for the trial. Ten replicates of five trees per replicate were painted with white paint on Nov. 20. A comparable number of trees were left unpainted, although they had been painted to about 3 feet the previous spring and now the old paint was becoming faded. On June 6, 2001 trees were then evaluated for the number of trees that had winter kill injury on the tree, the length of the winter kill injury that occurred below 7 feet, and the number of trees that had damage below 6 1/2 feet. It was noticed that many of the painted trees had some damage above the area painted but that the damage stopped where the tree was painted or within 1/2 foot of the painted area.

Results

Fifty trees were evaluated for winter kill in each treatment. The painted treatment had

the trunks painted on Nov. 20, approximately eight days following the freeze. Approximately half (46 percent) of the trees that were not painted showed some damage to the tree. Thirty-six percent of those unpainted trees showed damage on the trunk below a height of 6 1/2 feet. The trees that were painted 8 days following the freeze only reported damage to 18 percent of the trees, and only 8 percent of the trees had damage extending below 6 1/2 feet on the trunk. There were fewer trees damaged that were painted, even though most of the trees were 10 to 12 feet tall and the painting only extended to 7 feet. The amount of damage below 7 feet was also much more severe on the unpainted trees with an average of almost 1 foot (0.93) per tree damaged below the 7-foot height, compared to 0.16 foot for the painted trees.

The painting provided "control" to many of the trees even though it was applied after the freeze. I said "control," even though in reality the damage must have occurred on the night of the low temperature. I would speculate that cells were damaged or ruptured on that night. As the winter progressed, these injured cells leaked moisture that caused desiccation and then death of the cells. Painting the tree reduced the temperature, thus reducing some moisture loss. It also may have sealed some of the surface and reduced the moisture loss.

Painting to 7 feet seemed to give some added protection to the central leader, even though the leader was taller than 7 feet and the top was left unpainted. While the trees in the experiment were actually two years old, they had been cut back severely the previous winter and the trunk had been retrained. They were comparable to good to excellent 1-year-old grafted trees.

From these trials, painting the trunks and possibly the scaffolds on walnut trees shortly after the trees were injured from suspected winter kill temperatures may have prevented further damage or reduced the severity of the damage, since it is speculated that the injury may occur on the night the low temperature occurred. Warmer temperatures and sunshine occurring during winter may desiccate the damaged cells, causing death. The paint may reduce this drying and allow the cells to repair and continue to function. The paint was applied a week following the freeze. Painting the tree earlier may or may not have given better protection. Observations throughout the winter showed that the bark on the un-

painted trees became darker and showed more injury as winter progressed. Probably the benefit from the paint would decrease the longer the application was delayed following the freeze event.

This article originally appeared in the Walnut Marketing Board's Walnut Research Reports 2001 and is used with the permission of the author.

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NZ Storage, cont'd from p. 4

using non-standard chemicals or procedures (as some growers have attempted). Some of the "finer points" of flotation grading remain proprietary to HortResearch. (Contact David Klinac or KCCC Ltd if you require further information). Whatever approach is adopted, the fewer inferior-grade nuts that are put into storage to begin with, the better they will keep.

KCCL also developed use of open-weave onion bags to store chestnuts. Coupled with a special coolstore layout involving careful stacking to allow ease of airmovement, and low temperature storage (0 to -2° C). Partial drying of the nuts is carried out under controlled conditions and the development of rots and surface mould is minimised. Although being used primarily for the storage of processing-grade chestnuts, fresh nuts remain in saleable, even exportable condition for a surprisingly long time before drying out irreversibly.

Plastic bags and onion bags are however only the two opposite extremes of the spectrum. There are other ways to store nuts. Where longer-term storage is required, but without the water and weight loss of onion bags at sub-zero temperatures, then something as simple as "kleensacks" or potato-style 10-20 kg paper bags can be a useful compromise. Using these at conventional 0-2° C coolstorage temperatures can work very well. Rots and moulds are kept to a minimum, but water loss is not excessive. (Care must be taken with nut quality going in, however, especially nut wetness). Leave bags open for up to a week in coolstorage, to help dry out. A combination of a paper bag and a plastic bag together can also work well, and allows a degree of "fine-tuning". Contact Ray Knowles (07-825-2744) for more details.

Free Listings are available on
the WCGA Online
Growers' Directory
Get your application on the
website at
<http://www.wcga.net>

Looking further ahead:

There are some new dip and wash chemicals currently under test that promise to be much more effective than "Vortexx". Some revised washing and dipping procedures may also make it easier to get at deep-seated latent fungal infections sitting beneath the shell, on the surface of the pellicle: currently still proving troublesome.

Controlled drying of chestnuts is another key area. Even a few percentage points difference in moisture content can make a major difference to susceptibility to fungal rots and greatly increase storage life. The problems are:

1. How to measure and monitor these differences easily and non-destructively.
2. How to carry out controlled drying of a large batch of chestnuts quickly and accurately so that all chestnuts within that batch end up with the same moisture content. (Be warned: incorrect drying of NZ chestnuts can produce bad taints and off-flavours).

Controlled atmosphere (CA) and modified atmosphere (MA) storage of chestnuts has been attempted with some degree of success. We now think we've got a much better, cheaper technique that will work. It's still experimental, and it would require some radical changes to current chestnut handling and storage procedures, but it could mean effective year-round storage of fresh chestnuts with negligible quality loss. Fingers crossed.

Until then:

- the cleaner the nuts the better
- the drier the nuts the better
- the colder the nuts the better
- and in most instances the details of chestnut storage will be the concern of the packhouse and buyer with whom you will need to consult.

p p p



2003 Membership Renewal / Application
Western Chestnut Growers Assn., Inc.

\$25.00 individual member
\$35.00 household membership
\$26.50 Canadian individual member
Total amount enclosed
\$_____

Date

(Please print)

Member
First Last

Farm/Business/Organization Name

Address

City State/Province Zip/Postal Code

Phone () Fax ()

Email: Website URL:

The following information is voluntary on your part, but will help your association better understand the growth and status of the chestnut industry. Check those boxes that apply:

- o Commercial Grower o Nursery
o Prospective Commercial Grower o Consultant
o Researcher/Educator o Vendor
o Hobbyist
Acreage in chestnuts:
o < 1 Acre o 1-5 Acres o 6-20 Acres o 21-50 Acres o 51 + Acres
Chestnuts first planted:
o Pre-1990 o 1990-1993 o 1994-1997 o 1998-2001 o Not yet planted
Percentage of seedlings:
o Sell grafted trees o Sell seedlings o Sell scion wood o Sell seed nuts
o Sell nuts retail o Sell chestnuts whsle o Sell mail order o Sell on-line
o Sell at farmers' mrkts o Sell at farm stand

Cultivars grown:

2002 Production: lbs.

Photocopy this form and send with your check for \$25.00 (individual member), \$35.00 (household membership) or \$26.50 (Canadian individual membership) made payable to Western Chestnut Growers Assn., Inc. to Ray Young, Secy/Treas, PO Box 841, Ridgefield, WA 98642.

Make your plans today to attend the WCGA Annual Meeting in the Greater Portland area. June 28-29, 2003

Contact Chris Foster for further information (503) 621-3564

Email: foster@europa.com

or check out the WCGA website at

http://www.wcga.net

Reservations must be in by June 23rd

