



# The Chestnut Grower

Vol. 13, No. 1

Published by Chestnut Growers of America (CGA)

Winter 2011

## Australian Chestnut Trees to Go

*Australian Weekly Times Now, Dec. 9, 2010*

About 4,400 chestnut trees are about to be removed in the Ovens Valley in a bid to eradicate Australia's first outbreak of chestnut blight.

Victoria's Agriculture and Food Security Minister Peter Walsh announced the move today (Dec. 9) after the Department of Primary Industries, in consultation with the federal government and other states, had determined the disease could be eradicated.

"We are now working with landholders to remove about 400 infected chestnut trees and up to 4,000 at risk chestnut trees on nine properties in the Ovens Valley to protect this valuable industry," Mr. Walsh said.

"The costs and work associated with removing the trees will be borne by the Victorian Government to lessen the financial impact of this outbreak on growers."

Mr. Walsh said the federal government had also agreed to reimburse commercial chestnut growers for trees which were removed.

Chestnut blight, which has had a disastrous effect on chestnut production and native chestnut forests in Europe and the U.S., was first detected in the Ovens Valley in September this year (2010).

Mr. Walsh said DPI had acted swiftly to contain the outbreak and protect the chestnut industry, which produces more than 80 percent of the nation's chestnuts.

"Since the disease was detected, about 150,000 chestnut trees throughout Victoria have been surveyed for signs of infection," he said.

"Precautionary inspections of 500 oak trees and 1,200 eucalypts in and around infected properties have also taken place. (cont. pg. 5)

## Annual Meeting Heads to Midwest

Save the date! The 2011 Annual Meeting of the Chestnut Growers of America will be held the weekend of June 17-19 in and around Louisiana, Mo.



Plans are in the works for members to visit Chestnut Ridge, the farm of Dale and Linda Black, Rockport, Ill., and the NRCS Plant Materials Center and Forrest Keeling Nursery, both near Elsberry, Mo. Saturday dinner will be on the Mississippi River.

An optional tour Sunday will be offered at the University of Missouri's Horticulture and Agroforestry Research Center, New Franklin, Mo. (about two hours west).

See you soon! CGA

### In this issue:

<b>Annual CGA Meeting Heads to Midwest!</b>	<b>1</b>
<b>Australian Chestnut Trees to Go</b>	<b>1</b>
<b>Op/Ed: Tester Amendment</b>	<b>3</b>
<b>Locating Sweet Chestnut Trees in Scotland</b>	<b>4</b>
<b>Chestnut Harvesting: Suck it Up!</b>	<b>6</b>
<b>Chestnuts Go for a Dip</b>	<b>7</b>
<b>What I <i>Wouldn't</i> Do Again</b>	<b>8</b>
<b>Chestnuts Roasting... And Roasting!</b>	<b>9</b>
<b>Save Every Drop for Your Crop</b>	<b>10</b>



## A Message from the President

MIKE GOLD  
THE CENTER FOR AGROFORESTRY  
UNIVERSITY OF MISSOURI

*The good, the bad and the ugly. No, I am not turning into a movie historian although I do like Clint Eastwood as both an actor and a director. The good news is that in the Midwest region (Missouri-Kansas-Iowa-Illinois) the chestnut harvest of 2010 was excellent and nut sizes were as large as we have ever seen. Demand outstripped supply for many producers throughout the region. The bad news comes from Australia where the arrival of chestnut blight (*Endothia parasitica*) has devastated farmers in some of their chestnut producing regions and has all Australian growers worried about where the blight will show up next and if their efforts will suffice to control the outbreak.*

*The ugly? Read the op/ed piece by CGA member Carolyn Young. If Carolyn's reading of SB510, the Food Safety Modernization Act is accurate, CGA will indeed need to be in contact with our legislators throughout the U.S. to get this bill amended. Carolyn's take on the legislation points to devastating consequences for our fledgling U.S. chestnut industry.*

*One of our CGA members is Missouri Sen. Kit Bond, a fellow chestnut grower who retired from the US Senate as of January of 2011. I am hopeful that Sen. Bond can provide CGA the proper contacts in Washington, D.C., to sort out the specifics with regard to SB510 and the implications for CGA members and the U.S. chestnut industry.*

*Finally, we have set the date and location for our 2011 CGA annual meeting, I look forward to seeing many of you in our neck of the woods this coming June 17-19. Details will be forthcoming in the Spring issue of The Chestnut Grower.*

### CHESTNUT GROWERS OF AMERICA BOARD OF DIRECTORS

PRESIDENT Mike Gold (573) 884-1448  
e-mail goldm@missouri.edu  
VICE PRESIDENT Bill Nash (517) 651-5278  
e-mail nashfarm@shianet.org  
SECRETARY-TREASURER Ray Young (360) 887-3669  
e-mail ray@chestnutsonline.com  
DIRECTOR Bob Wallace (386) 462-2820  
e-mail chestnuthilltreefarm@gmail.com  
DIRECTOR Dennis Fulbright (517) 353-4506  
e-mail fulbrig1@msu.edu  
DIRECTOR Lee Williams (509) 765-3922  
e-mail techestnuts@scml.us  
DIRECTOR Sandy Bole (503) 625-1248  
e-mail BenBole@aol.com

Newsletter Editor: Mike Gold  
(573) 884-1448; goldm@missouri.edu  
Newsletter Coordinator: Michelle Hall  
(573) 882-9866; hallmich@missouri.edu

### NOTICE

The Chestnut Grower is published quarterly by the Chestnut Growers of America at 203 ABNR, Columbia, MO 65211. Copyright 2011. Original articles may be reprinted with written permission of the author and this publication.

Web site: [www.chestnutgrowers.com](http://www.chestnutgrowers.com)

Single membership is \$30 per year per person, household membership is \$40 and associate membership is \$50. Members receive The Chestnut Grower quarterly. For foreign delivery contact the Editor for pricing. Back issues may be obtained by members. Membership applications may be obtained from the Secretary-Treasurer.

### POSTMASTER

Send address changes to CGA, 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. For more information and specifications, contact Michelle Hall at (573) 882-9866 or hallmich@missouri.edu.



The Center for Agroforestry  
University of Missouri

### PUBLICATION DEADLINES

Fall issue deadline 9/15 mailed 10/15  
Winter issue deadline 12/15 mailed 1/15  
Spring issue deadline 3/15 mailed 4/15  
Summer issue deadline 6/15 mailed 7/15

# How to Put a Chestnut Grower Out of Business: Pseudo-Food-Safety on the Farm

*an opinion/editorial piece by Carolyn Young, Allen Creek Farms*

From the U.S. Senate Web site Senator Jon Tester tells us, “Montana families and folks across the country deserve to know that the food on their dinner table is safe. This common sense new law will give folks that peace of mind by putting more accountability where the risk is. Small businesses aren’t responsible for nationwide food-borne illness outbreaks, and they shouldn’t be blown out of business by the same regulations needed for the giant food factories. I’m proud we were able to work together to protect the jobs of, and strengthen business for countless family farmers and food processors across the country.”

“Tester amended the new law to shield small farms and food processors from federal regulations they can’t afford and don’t need, while raising food safety standards for industrial-scale facilities that produce enormous amounts of food and ship it across the country.”

If Sen. Tester were a chestnut grower or even a small family farmer of some other crop he would understand that small family farms of today are not the small family farms of the ‘50s and ‘60s when he grew up. The small family farm today doesn’t market the way they did then. Many of them today sell nationwide on the Internet. It opens up a market never before available to the small farmer and actually helps him/her make a real profit.

CGA has just over 100 members today. One third of them have Web sites that allow customers to either buy online or allow customers to call and place an order. Those of us who market in this way are subject to all the heavy-handed regulations included in the Food Safety Modernization Act (SB 510) and the regulations are enough that some of us may be driven out of business.

The Tester Amendment is sadly lacking in help for our members. If any of us ship more than 275 miles from our farms we do not qualify for Sen. Tester’s exemption. He seems to think that what makes a small farm is income less than \$500,000 a year and doesn’t seem to have a clue what that mileage limit does. In our case only 8 percent of our customers are within that 275-mile limit.

And for those of us who sell value-added products (chestnut flour, dried chestnuts, baking mixes) we are now forced into developing a configuration management system that is all but impossible to do. As an example let’s take a look at our Chestnut ‘N Honey Cornbread mix. It contains yellow cornmeal, chestnut flour, wheat flour, buttermilk powder, sugar, dried honey, baking soda, baking powder, and salt – nine ingredients in all. For each packaged mix I sell I will now have to be able to tell an inspector the date on which the cornmeal was purchased, and where I purchased it. The same works for each of the other eight ingredients. Of course I have to be able to identify the date the mix is being put together and then I have to be able to tell which customer bought that particular bag. And when I run out of sugar half way through making my 30 mixes or so, I have to open a new bag of sugar and now the configuration changes for the mixes remaining to be done. In addition I will have to somehow identify on the label the batch it came from since a customer could order more than one cornbread mix that didn’t all come from the same batch.

The new regulations will affect the co-ops in ways they never imagined. For the fresh nuts they sell, they’ll now have to be able to verify which orchard they came from for each customer who buys them. That means they can’t be processed together and they can’t be stored together without being fully identified. For the dried nuts they’ll have to separate each container in the drying area and identify them according to source. If they mill flour they will have to make sure that they’re only milling from one orchard at a time and then be able to identify each container and the customer to whom the product is being sold. Since we understand that listeria, e-coli and all their egregious cousins can be transmitted to food from the equipment the nuts touch, equipment will have to be sanitized between each producer’s batch. The paper trail and additional labor hours involved is beyond belief.

I worked for many years in aerospace designing computer systems to support our manufacturing lines. We had an entire department of about 100 or so people to maintain our configuration management system. While it dealt with wires harnesses, backplanes, **(cont. pg. 8)**

# Woodland Trust Appeal Over Sweet Chestnut Tree: *The Woodland Trust Has Asked the Public to Pinpoint the Location of One of the Country's Oldest Trees*

from the BBC, Oct. 21, 2010, <http://www.bbc.co.uk/news/uk-scotland-11595745>

The charity launched the Ancient Tree Hunt in 2007 and this autumn it wants the public to help track down the sweet chestnut.

The tree is said to be one of Scotland's most distinctive, with links to the Romans and Mary Queen of Scots.

The trust said the sweet chestnut is poorly represented on their database of ancient trees.

Regarded as an honorary native introduced to Britain by the Romans to provide a ready supply of chestnut flour, the sweet chestnut originates from southern Europe, western Asia and north Africa.

Edward Parker, the Ancient Tree Hunt project manager at the Woodland Trust, said: "The sweet chestnut has so many important historical associations and it also rather surprisingly grows some of the biggest trunks in the UK, yet the Ancient Tree Hunt has just over 3,000 records for the species, while oak accounts for nearly half of all the 73,000 trees on the database.

"We know there will be many more out there, so we are urging people to help us gain more data.

"Ancient sweet chestnuts have distinctively twisted, spiral-like trunks when they grow old, so they are easily recognisable to the public, especially at this time of the year while the nuts are available.

"It's also a great way of stocking up on free food for traditional autumn or Christmas dishes with the family."

Said to be the stoutest of its species in Scotland, the Cockairnie sweet chestnut, found at Cockairnie House, near Aberdour, Fife, has a girth of 8.82 metres (29 feet).

Cockairnie House is about 500 years old and the Woodland Trust believes the tree was probably planted shortly after the house was built.

The tree with the oldest recorded planting date in Scotland is the 1550 sweet chestnut at Castle Leod, Strathpeffer.

Estate records show that the tree was planted in 1550 by John Mackenzie, a privy councillor to King James V and Mary, Queen of Scots.

The Woodland Trust said there seemed to be a strong connection between the sweet chestnut and to the time of Mary Queen of Scots.

The Queen Mary's tree in North Lanarkshire, is reputed to have been planted by the Queen in 1561 during a visit to Cumbernauld Castle.

Although the castle no longer exists, the ancient sweet chestnut survives.

It is also thought she planted the Balermio sweet chestnut, when she visited the abbey in 1565.

Another castle frequented by the Queen was Melville Castle in Midlothian.

During one of her visits, David Rizzio, her Italian secretary and close companion, is said to have planted a tree as a token of his love for her by the banks of the River North Esk. *(Tree pictured above.)*

The tree survives to this day next to the stable block, which is now known appropriately as Chestnut House. CGA

*Thanks to CGA member Tom Green for suggesting this article.*





## Trees to Go (cont. from front page)

“This has involved surveying more than 900 residential and 300 commercial properties and restricting the movement of chestnut blight host material from the northeast of the state to prevent further spread of the disease.

“Further work will also be undertaken by the department over the next three weeks to determine whether more trees are at risk of infection in the Ovens Valley and should be removed.

“DPI expects that all affected trees will be removed by the start of January and the area will be declared free from chestnut blight by the spring of 2013 following extensive disease monitoring.”

Discussions are also underway with interstate authorities to determine if there will be any restrictions on the movement of chestnut and oak material from affected areas of Victoria while the eradication program proceeds.

The cause of the outbreak is still uncertain.

## Blight Halts Australian Chestnut Production for 10 Years

*Australian Broadcasting Corporation, Dec. 16, 2010*

Growers who have been affected by an outbreak of chestnut blight in the state’s northeast say it will be at least 10 years before they recover.

Australia’s first outbreak of the fungal disease was confirmed in September.

The Department of Primary Industries (DPI) has started removing about 4,500 trees under an eradication program.

Eurobin chestnut grower, Brian Casey, says eradication is the best thing for the industry as a whole.

But he will lose a crop worth \$125,000 and it will be two years before he is allowed to re-plant his orchard.

“It’s 10 years before you’re starting to get any production again,” he said.

“You’re probably looking at another five years on that before you’re getting significant production.”

There are also concerns the disease could spread to other types of trees.

David McIntyre from Chestnuts Australia says it could also affect oak trees.

“It doesn’t necessarily severely impact oak trees in terms of killing them, it’ll kill limbs,” he said.

“It’ll also hold cankers there to spread spore for a long time. There’s some work in Japan which indicates there is some possibility of transfer to eucalypts.” CGA

### ***Excerpted letter from the Kanes, shared by Ken Hunt***

Dear Ken,

Our chestnut farm is about 500 km north of the blight incursion. The affected area seems to be a small zone near Bright, in NE Victoria and tree destruction is now underway. (Details are on the local association’s website: [www.chestnutsaustralia.com.au](http://www.chestnutsaustralia.com.au).) Even so, agricultural authorities have surveyed our trees and taken random samples for testing – we haven’t heard anything more from them in the past month, so hopefully that means we are not showing any signs of infection.

We have set up a Web site ([www.tweenhillschestnuts.com.au](http://www.tweenhillschestnuts.com.au)) where you will be able to get an overview of our operation.

We’d love to visit the U.S. industry again sometime in the future. We remember with fondness the willingness of everyone to share their observations and discuss all things chestnuts.

With kind regards,  
Heather & John Kane

## Chestnut Harvesting: Suck it Up!

Researchers at the University of Missouri are looking into methods for increasing chestnut harvest efficiency and profitability of chestnut production.

Although alternative harvesters exist, they so far have proved to be either cost prohibitive or ineffective for use on small acreages in the Midwest. For this reason, a time motion study was performed to test the harvest efficiency of an inexpensive and commercially available paddock vacuum.

The project, “Low-Cost Mechanical Harvest Equipment for Chestnut,” was performed by Drs. Michele Warmund and Larry Godsey, as well as Andrew Biggs and Shannon Heinze, M.S. Graduate Students.

The time required to harvest and sort chestnuts was compared using a modified Greystone Paddock Vacuum™ or a Nut Wizard™ as harvesters.

Here’s what they found: The time required to harvest and sort was 2.8 and 4.8 sec per nut for the vacuum and the Wizard, respectively. Long periods of vacuum used resulted in forearm fatigue. It was also noisy, and collected dust and soil clods along with the chestnuts, which required sorting. The vacuum also required an additional



**Left:** Harvesting with Nut Wizard. **Middle and Right:** Harvesting with Paddock Vacuum.

piece of equipment for towing through the orchard. The vacuum also left behind unopened burs and would require a follow-up “Wizard” harvest to glean all harvestable nuts from the orchard to maximize profits, and provide proper orchard sanitation to prevent weevil build up. In contrast, the inexpensive (<\$50), low-tech Wizard generates no dust but required more operator bending, which contributed to back fatigue, and failed to pick up chestnuts in depressions in the soil surface.

Harvest time of nuts can be reduced by 42 percent with a paddock vacuum as compared to use of a Nut Wizard with less operator fatigue. An economic analysis of harvest costs associated with the vacuum and Nut Wizard is in-progress. *CGA*

## Survey Time!!

The University of Missouri Center for Agroforestry has again created an annual CGA grower survey. This information gives the association and its members a better idea of the chestnut industry in this country and where it is headed.

We again have put the survey online to simplify the process for both growers and those tabulating the

results. You will soon be receiving an e-mail with a direct link to the survey, for ease of use. Please take a few minutes of your time to complete.

Thank you so very much for participating in this important survey! Results are completely anonymous. Look for a summary of results in a future issue of The Chestnut Grower. *CGA*

## Chestnuts Go For a Dip



We tried something a little different at our Annual Missouri Chestnut Roast this year at the chestnut tasting booth! We provided an olive oil and herb dip alongside fresh roasted chestnuts. It was very popular – we scraped the bottom of the dip bowl just as the event ended!

The idea started a few weeks before our event – we were roasting chestnuts at another gathering. Our booth was across the way from an Italian food vendor, who was giving out free samples of meatballs, bread and an olive oil-based dipping sauce. After we had finished sampling the bread, it seemed only logical to try our chestnuts in the savory concoction. We immediately knew we had to offer it at the roast!

Ina Cernusca took the reins, trying out different combinations until she came up with what's below. She then gives you her best guess on quantities for a smaller batch (we were feeding 3,000 guests, after all!)

### **Olive oil and herbs dip**

#### **(what I used for the Chestnut Roast)**

Olive oil: 3 bottles Extra virgin olive oil (1.5 l each)  
 Star Golden Balsamic Vinegar: 2 bottles  
 2-2.5 oz fresh basil  
 2 jars peeled garlic  
 Italian parsley  
 Salt  
 Pepper  
 Spice Islands – Garlic & Herb Bread Dipping Spices (dehydrated garlic, spices, sea salt, sweet red pepper flakes)

### **My best guess for a small quantity**

- 1 cup extra virgin olive oil
- 1 tablespoon balsamic vinegar (clear not dark)
- 1/4 cup fresh basil, chopped
- 1 tablespoon fresh parsley
- 4 cloves garlic, minced
- Garlic salt – to taste
- Ground black pepper – to taste
- Sweet red pepper flakes – to taste (optional)

## BOND ORCHARD SELECTION™ Chestnuts



Working with the University of Missouri Center for Agroforestry, I have, over the last 17 years, established a very successful Chinese chestnut orchard whose germplasm produces quality chestnuts with hybrid vigor and large tasty nuts.

Forrest Keeling Nursery in Elsberry, Mo., grows outstanding seedlings – with its patented Root Production Method (RPM) – that reach heights of 3-5 feet the first season, and have produced dozens of burs in the third year following outplanting.

– Kit Bond

For more information, contact Forrest Keeling Nursery,  
 800-356-2401 or [info@fknursery.com](mailto:info@fknursery.com)

• [kitbond.com](http://kitbond.com) • [fknursery.com](http://fknursery.com) •





---

## Pseudo-Food-Safety on the Farm (cont. from page 3)

circuit cards, etc., the principle was exactly the same there that it is for a system to track our baking mixes. Just how do the politicians think that a small family farmer can do this?

The absurdity in the whole bill, even without the Tester Amendment, is that if the inspectors in each state who are being paid to inspect facilities had been doing their job in the first place there wouldn't have been a need for this legislation. The vast majority of inspectors do a good job and it's only a few that cause the problem. Instead of fixing the problem the FDA seems intent on fixing the blame. Or maybe I'm misreading the whole thing and it's really just a guise to create more government employment. We have a licensed commercial kitchen here and we are inspected annually. Our inspector is extremely thorough and goes over everything to see that we meet all the state regulations. Just how much more needs inspecting than he already does?

We need to be doing more to encourage growers to develop value-added products. It creates more market for our crops and provides more income, but with this legislation it will stifle any growth out there. CGA needs to become involved in the future of our orchards.

So what can we do about it? As an association our Board of Directors can take a formal stand. As individuals we can let our representatives know how it will impact us. For those who voted for it, it's obvious they didn't understand what it could do. To locate your U.S. Senator you can go to [http://www.senate.gov/general/contact\\_information/senators\\_cfm.cfm](http://www.senate.gov/general/contact_information/senators_cfm.cfm)

You can find your member of the House at <https://writerep.house.gov/writerep/welcome.shtml>

---

## What I Wouldn't Do Again

“I needed to topwork 36 older Willamette chestnut trees to another cultivar due to poor performance and crop load limb breakage. I used bark inlays on stubs as big as 3-4 inches. Normally I use aluminum foil and sandwich baggies to seal up the grafts but this time decided to use Doc Farwell's grafting compound to do the sealing, figuring it would be an overall time saver with less aftercare of the graft. While putting on the mustard-colored compound, I decided that more is better and covered the entire cut area of the stub with the compound.

Well, the effects of sealing the entire stub became evident over the growing season. I started noticing small scarab beetles feeding on the stubs. On close inspection of the feeding areas, I could smell fermentation and the area being overly wet. My over enthusiasm of sealing the stubs basically had sealed in all the moisture accumulating at the stub with no way for it to evaporate. I didn't lose any of the grafts, but fear I may end up with some hollow trunks due to allowing a site for fungus to get a toe hold.

I now pretty much stick with my original foil and sandwich baggie, and if I use the Doc Farwell's compound, it only goes on less than half of the overall stub to allow for the stub to breathe.” CGA

*Don't look now but we've posted each and every "What I Wouldn't Do Again" online at The Center for Agroforestry Web site. Now you can browse these tips anytime. Go to <http://www.centerforagroforestry.org/pubs/chestnut/index.asp> to see them all!*

*Please send submissions for this column to Michelle Hall at [hallmich@missouri.edu](mailto:hallmich@missouri.edu)*



# Chestnuts Roasting... And Roasting... And Roasting!!!

Deb Milks of Chestnut Charlie's dug out some great photos they've taken of chestnut roasting from around the world to share with our readers! It's amazing how many ways there are to do chestnuts roasting on an open fire! She also shared how she and Charlie roast at events. Thanks again for passing these along, Deb! *Share your roasting photos with us any time at [hallmich@missouri.edu](mailto:hallmich@missouri.edu) CGA*



**Above left:** Paris chestnut roaster. **Above middle:** Deb looks on as a street vendors roasts in Pisa, Italy. **Above right:** At a church festival in Lucca, Italy. **Left:** Charlie roasts out of the back of his vehicle! **Right:** A huge roaster at the chestnut festival in Marradi, Italy.



**Above left:** Chestnut festival in Marradi, Italy. **Above middle:** Roasting in the streets in Lucca, Italy. **Above right:** Deb and Charlie at a supermarket roast. **Left:** Deb uses two types of roasters! **Right:** Roasting over a fire pit in the streets of Marradi, Italy.



# Save Every Drop for Your Crop: Lessons from Deciduous Fruit Crops

*from the December 2008 issue of the Australian Nutgrower  
by Bas van den Ende, Shepparton, Victoria*

With low water allocations this season, orchardists will have to make some crucial decisions. A good irrigation system is both highly effective and highly efficient. To achieve both, a system must be well designed, maintained and managed.

## Drip versus microjets

The use of drip irrigation is becoming more popular, because:

- a. Microjets are about 70 percent efficient, while drip irrigation is 90 to 95 percent efficient.
- b. Drip irrigation can save 30 to 50 percent of water. This means, that you could irrigate up to 2 hectares of orchard with the same amount of water using drip, compared with one hectare using microjets. Recent trials in fruit trees have proved this.
- c. Drip irrigation allows water and fertilizers to be delivered exactly when and where the trees need them.
- d. A drip system allows you to apply only the precise amount of water a tree can beneficially use.
- e. Water loss from evaporation and run-off are minimized with drip irrigation.
- f. A drip system minimizes weed growth between rows.
- g. Drip systems are ideal for heavy soils with low infiltration rates since the water can be applied at slow enough rates for the soil to absorb it, minimizing or eliminating runoff.
- h. Drip irrigation does not prevent frost damage. Microjets can prevent frost damage, but only down to a few degrees below zero.

In a 3-year trial with nectarine trees in the Swan Hill district, Heather Field of DPI Victoria showed that double drip line was the better performer over microjets in terms of yield, fruit size and costs versus returns. Advantages of the double drip line improved water use efficiency, maintained optimum soil moisture, decreased the amount of water applied, improved control of diseases and reduced the amount of drainage water. In an Open Tatura planting of Williams' pear trees near Ardmona, double drip line saved an estimated 44 percent of water. From 2003, when the 1.14 hectare planting was established, to 2008, a total

of 15.64 megalitres (MI) of water per hectare was applied. We estimated that 5-year-old pear trees in the Goulburn Valley under microjets would have conservatively used a total of 28 MI per hectare.

We used evaporation readings to schedule irrigation frequency and to estimate the water requirements of young Williams' pear trees. We adjusted the evaporation readings by determining the amount of foliage that was actively transpiring water. We did this by estimating the fraction of shade that the trees cast on the soil surface at midday. This is known as the effective area of shade (EAS, explained below). Rain was also a factor in estimating the water requirements of young pear trees. In the third and fourth seasons we used a deficit irrigation strategy after harvest to save water, control tree vigor and induce early fruitfulness.

The drip line system of irrigating young Williams' pear trees provided us with a means of manipulating root growth and thus controlling top growth. Drip irrigation not only saved water, it helped us to control tree vigor and induce early fruitfulness without affecting yield or fruit size.

## Evaporation and tree water requirements

Knowing the tree's seasonal water requirements is a critical step in efficient irrigation management. Evaporation describes the process by which water is lost (evaporated) by way of soil and plant surfaces. Evaporation is measured daily from an exposed water surface in most government meteorological weather stations using the standard US Class A pan evaporimeter. Pan evaporation is abbreviated to Epan.

The evaporation readings are based on a fully grassed surface area, which is different from an orchard. Deciduous fruit trees take 10 to 12 weeks before the canopies are fully leaved out. As well, canopies of fruit trees usually do not cover the entire orchard floor. Therefore, to use evaporation as a tool to schedule and estimate the trees' water requirements, we had to make certain adjustments. These adjustments were researched and developed by Dr. Ian Goodwin and Mark O'Connell at the Tatura Research Institute. (cont. pg. 11)



## Save Every Drop for Your Crop (cont. from pg. 10)

Results from Tatura and overseas have shown that the amount of water that fruit trees use is directly related to the area of shade on the soil surface, abbreviated earlier as EAS. With a little experience you can estimate the percentage shade by looking down the tree rows at the amount of shade on the ground at midday on a cloudless day.

Currently, orchard tree irrigation practices are based on the use of published crop factors, pan evaporation and monitoring soil wetness. However, crop factors do not account for differences between orchards in transpiring leaf surfaces associated with tree size, tree density and training systems. Soil wetness is only an indirect measure of tree water use that relies on measurements made in small volumes of soil within large root zones that can be variable. Readings of soil wetness can therefore be prone to misinterpretation.

Deciduous fruit trees are perennial and go through stages of development from young non-cropping to fully grown and cropping, and the roots, shoots, leaves and fruit go through an orderly pattern of growth each season. This means that the trees' demand for water varies with tree age and seasonal growth cycles.

Fully developed canopies of conventionally fruit planted trees cover about 30 to 40 percent of the soil surface. High density plantings cover up to 70 percent of the soil surface, provided tree height is kept in relation to row width. We have also put the amount of rain in the equation when we estimated water requirements of the orchard. Post-harvest deficit irrigation also saved water with substantial reductions in vegetative vigor and no loss in yield. **CGA**



### Washington Chestnut Company

#### Quality Chestnut Trees from a Reliable Source

##### Available Cultivars:

Colossal  
Okie  
Belle Epine  
Prococe Migoule  
Marigoule  
Marival  
Marsol  
Bisalta #3  
Maron di Val di Susa  
Custom Propagation Services

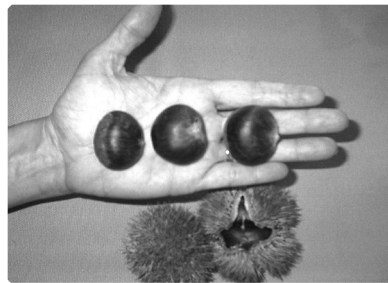
Washington Chestnut Company's Web site provides growers with more quality information for growing chestnut trees than any other source on the net. We are constantly performing independent self funded research to aid all chestnut growers with establishing and maintaining their chestnut orchard to achieve the best results possible. Make Washington Chestnut Company your source for seedling and grafted chestnut trees.

**Washington Chestnut Company**  
6160 Everson Goshen Rd., Everson, WA 98247  
Phone (360) 966-7158

[www.WashingtonChestnut.com](http://www.WashingtonChestnut.com)



**CGA**  
c/o Center for Agroforestry  
203 ABNR  
Columbia, MO 65211



**Dunstan American X Chinese  
Hybrid Chestnuts**

Larger nuts than almost all Chinese  
Chestnut varieties

Blight resistant and better tasting  
than European Hybrids!

Proven production for over 30 years  
all over America!

Unique selection of many types of  
fruit - Kaki persimmons, figs, low chill  
fruit, berries and much more

[www.chestnuthilltreefarm.com](http://www.chestnuthilltreefarm.com)

15105 NW 94th Ave. • Alachua, FL 32615 •  
800-669-2067 • 386-462-2820

Email: [chestnuthilltreefarm@gmail.com](mailto:chestnuthilltreefarm@gmail.com)