

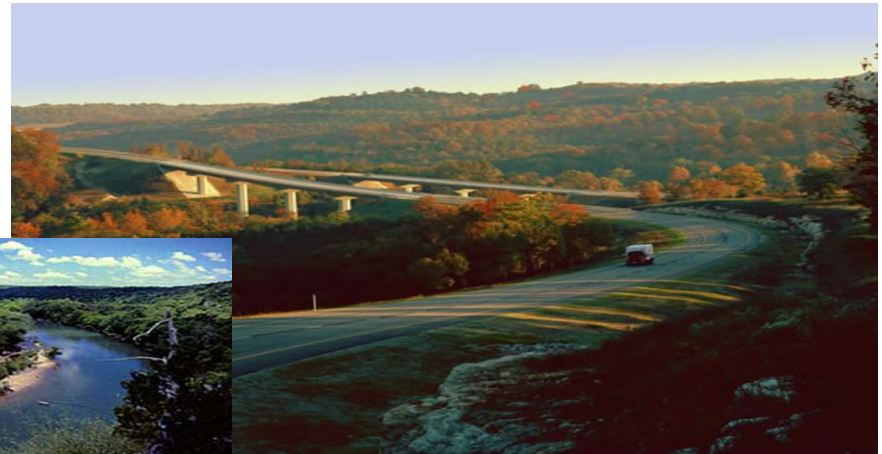
Chestnuts: Building a Perennial Specialty Crop Industry From Scratch

Great Plains Growers Conference

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St. Joseph, MO

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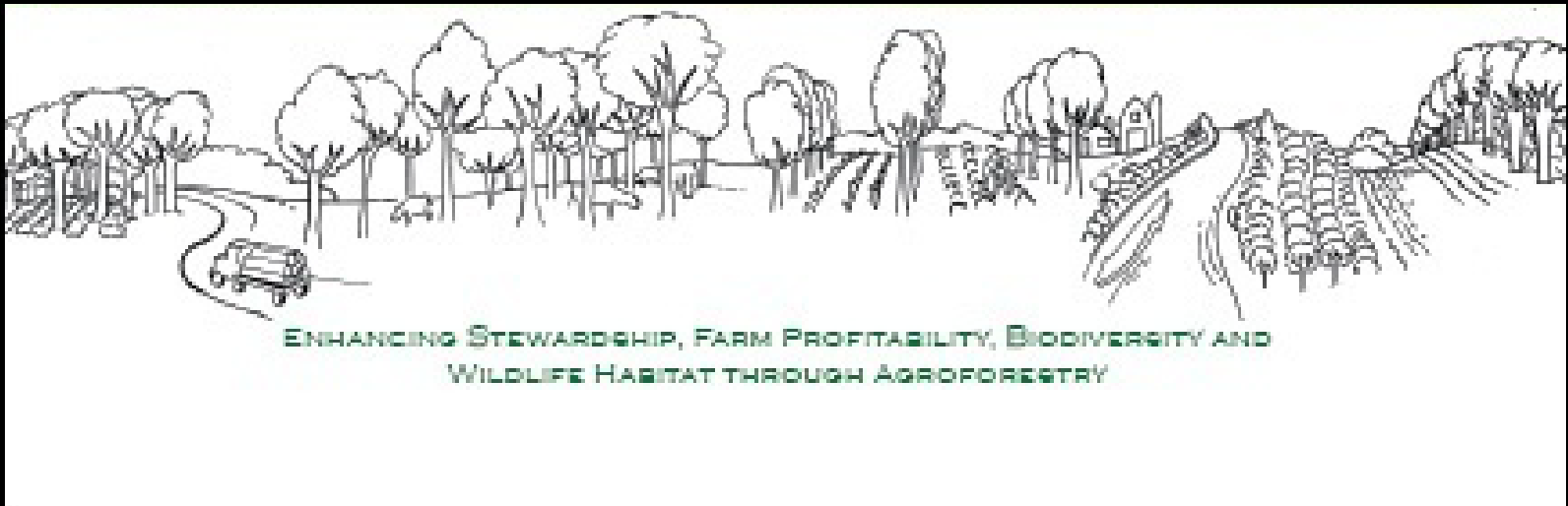


The Center for Agroforestry
University of Missouri

A Global Center for Agroforestry, Entrepreneurship and the Environment

AGROFORESTRY DEFINED

Mixtures of trees, crops and/or livestock to promote both resource protection as well as economic production



Recommended AF Textbook: Garrett, H.E. (ed). 2009. North American Agroforestry: An Integrated Science and Practice. 2nd Edition. American Society of Agronomy.

Five recognized agroforestry practices

Alley Cropping – Trees in rows with intercrops

Silvopasture – Trees, forage and livestock

Riparian and Upland Forest Buffers – protect streams

Windbreaks – Widely spaced rows to protect crops

Forest Farming – Cultivating beneath forest canopy

Forest Farming



Silvopasture



Alley Cropping

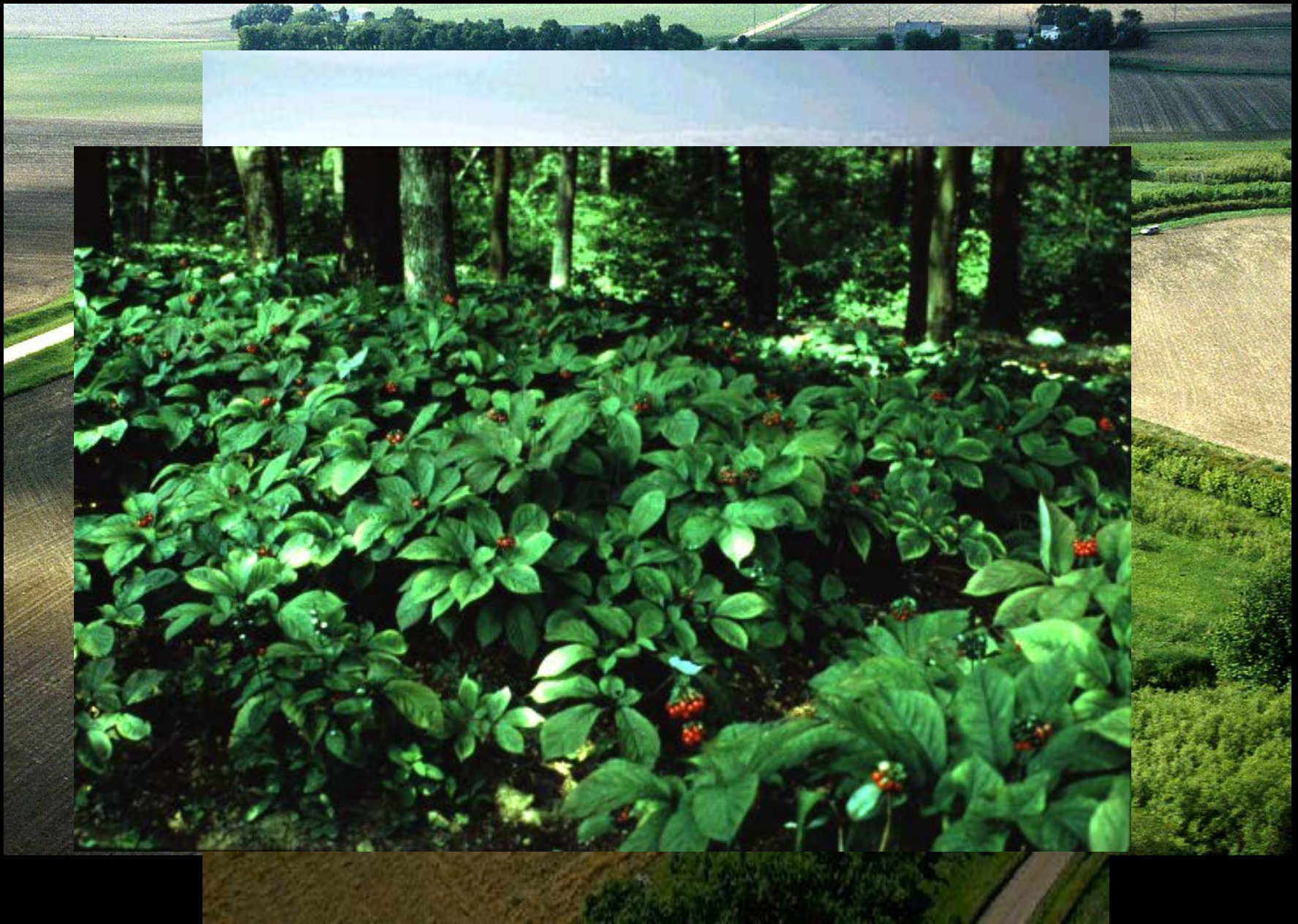


Riparian/Upland Buffers



Windbreaks





Specialty Nut Crops: Issues of Concern

- Farmers planting emerging specialty nut crops (chestnut, black walnut, elderberry, pawpaw, etc.) in the Midwest in response to increasing market opportunity.
- ✓ Farmers taking substantial risks due to the lack of sound horticultural and market information.
- ✓ Farmers who purchase emerging specialty nut crop nursery stock may be planting inferior material.
- ✓ Detailed financial decision making information is lacking for most specialty crops.
- ✓ Lack supporting infrastructure.

Alley Cropping

Planting trees or shrubs in rows at wider spacings, creating alleyways within which agricultural, horticultural, or forage crops are cultivated.



- Diversify farm enterprise
- Reduce erosion
- Improve water quality
- Protect crops
- Enhance biodiversity, wildlife habitat
- Improve aesthetics

Nut Trees for Alley Cropping



Black walnut



Northern pecan



Chinese chestnut

Eastern Black Walnut

6 row corn planter,
trees on 22.5 foot
centers, 5 feet between
trees in the row



Age 3



Age 5

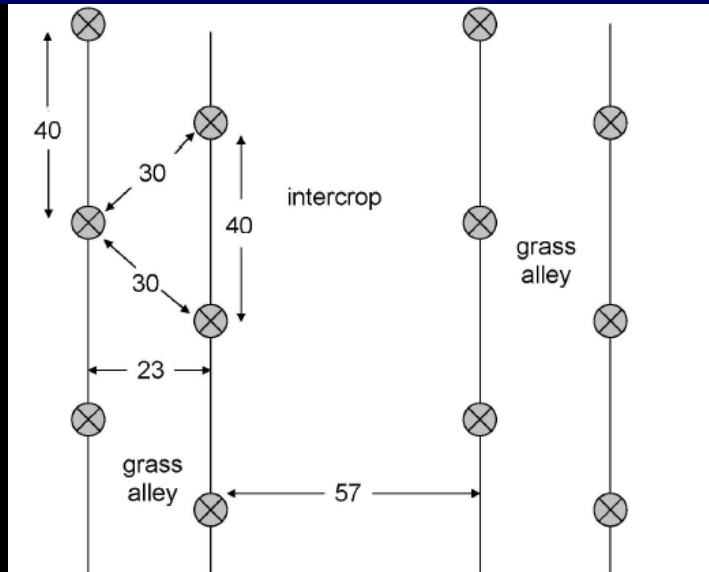


Age 9, 35 ft. tall
and time to thin



Alley Cropping Design - Pecan Orchard

Double row planting plan for pecan orchards. Tree locations marked by circles.



Double row pecan. 2 years after tree establishment. **Soybean intercrop.**



Double row pecan. 4 years after tree establishment. **Spring oat intercrop.**



Chinese Chestnut – Pumpkin Alley Cropping Napton, MO



Chinese Chestnut – Winter Wheat Alley Cropping Napton, MO



The MU Center for Agroforestry's Chestnut Program

1. Develop and test best chestnut cultivars and orchard production, management and harvest techniques
2. Ongoing market and consumer research
3. Increase consumer awareness and demand
4. ***Support growth of ***future chestnut farmers***
5. Future: Value-added product development not yet in our research portfolio. Needs to be.

Goal: Develop a thriving Missouri
chestnut industry

Chestnuts in the “Beech” Family

- Beech - beechnuts

➤ *Fagus*



- Oaks - acorns

➤ *Quercus*



- Chestnuts - chestnuts

➤ *Castanea*



- Horse Chestnut - **not related** to true chestnuts

➤ *Aesculus* (aka buckeye)

➤ **Not edible**



Chestnut Topics to Review

- Why a Missouri Chestnut Industry?
- What we know about chestnut production
- Markets and consumers
- What's on tap for 2014?

Why a Missouri Chestnut Industry?

- Missouri has ~107,000 farms, 2nd in USA
- Average farm size ~270 acres
- Commodity grain, seed crops dominate
- Large scale animal agriculture operations
- As is the case almost everywhere, making a living from traditional commodity production is tough for the family farm.
- Economically viable farms are very large scale

Why a Missouri Chestnut Industry?

- Missouri has a small tree fruit industry and our growers face fierce competition and low prices.
- New profitable farm-based enterprises are needed to provide alternatives for the family farm.
- Enterprise profitability will allow future generations to remain on the farm; strengthen rural communities.

Why a Missouri Chestnut Industry?

- Research on the U.S. chestnut industry reveals that:

- Demand outstrips supply for full-time U.S. chestnut producers

and

- Growers of high quality chestnuts - **with market knowledge** - receive high prices.

Chestnuts for Missouri?



Chestnut: Building a New Specialty Crop Industry in Missouri

Can we grow them? Yes

Are the yields good? Yes

Are there markets? Yes

Are the prices good? Yes

Well then, what's the hold up?

Why Chestnuts?

Chestnuts: The "UnNut" You'll Love!

As you consider healthy food choices for your family, why not "go nuts?"

Nuts offer a range of excellent health benefits and will add flavor, crunch and appeal to every diet. Many nuts are a delicious source of unsaturated fatty acids, protein, fiber and antioxidant vitamins like vitamin E.

Chestnuts are called the "UnNut" because nutritionally, they hardly resemble their tree-nut cousins. Unlike pecans and walnuts, chestnuts contain just a trace of fat. They are also the only nut that contains a significant amount of vitamin C. Like all plant foods, chestnuts contain no cholesterol. For weight watchers, chestnuts are a low-calorie feast.

Not only are chestnuts delicious with a sweet, mild flavor, they are rich in nutritional benefits. Just a handful of other foods can match the nutritional value of a chestnut!

Chestnuts Add the Gourmet Flair
There's much more to chestnuts than roasting on an open fire!

You'll discover a whole new flair in gourmet food when you start preparing the many exciting recipes that feature the chestnut.

Chestnuts can be incorporated into a wide range of dishes, from soups and poultry to appetizers, casseroles and pastries.

A puree made from cooked chestnuts is used as a filling for dessert crepes, and candied chestnuts or "maroons glace" are used in a variety of sweet desserts.

Nutritionally, chestnuts are similar to whole grains and offer a sweet, subtle flavor.

Go nuts for your heart!
We've all heard that nuts are filled with fat and off limits for dieters.

Photo: Jacqueline Kaut, Chestnut Staff, Chief Pine, Arkansas, Tullahoma State, Tennessee, Mo.

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The status of our knowledge

This is a NEW crop for the Midwest

➤ There is a lot we do not know

➤ There is a lot we do know

➤ What we don't know (but we are getting there)

- Which cultivars are best for which locations?

- Current situation

 - Small acreage under test at HARC (<8 acres total)

 - Plantings are young

 - HARC cultivars still increasing in annual yield

The status of our knowledge

➤ What we do know

- Chinese chestnuts grow well in Mid-Missouri
 - Matching to proper sites is critical (**wet feet** deadly)
 - ✓ Grafting success high (except 'Qing' and 'Eaton')
- Annual yields, selected trees, impressive (+100 lbs/tree)
- HARC has only ~6 acres of young, commercially producing chestnuts (65 different cultivars)
 - Yield in 2007 = 4,000 lbs (spring freeze, dry year)
 - Yield in 2008 = 6,000 lbs (excellent moisture)
 - Yield in 2009 = 10,000 lbs (excellent moisture)
 - Yield in 2013 = 14,000+ lbs (late summer drought)
- Irrigation (moisture) appears key to annual crop success

What we do know

- Wide selection of cultivars **not** widely available commercially (see Forrest Keeling Nursery)
- Currently recommend only 4 cultivars **out of 65** under test
- Commercial production should be based on growing **tested chestnut cultivars**
- Repeated harvests (daily) required to ensure crop quality
- Post harvest storage quality differences between cultivars

■ What we do know

- Successful growers exist, cannot meet demand
- Consumers receptive when exposed to chestnuts
 - Preferences for “Buy Local” premium is for real!
- Direct-to-market retail / wholesale prices are high
 - Wholesale \$2.00-\$3.50/lb
 - Retail 4.50-\$8.00/lb
- Producing and marketing a quality product is essential for market growth

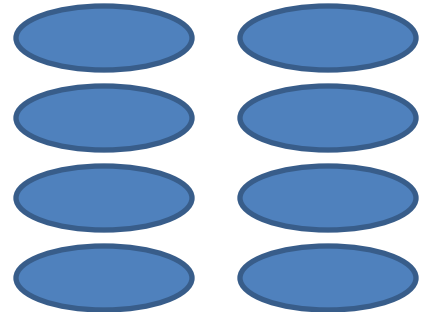
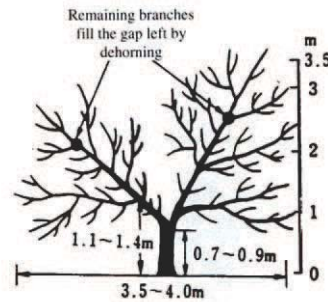
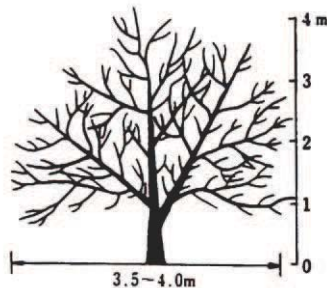
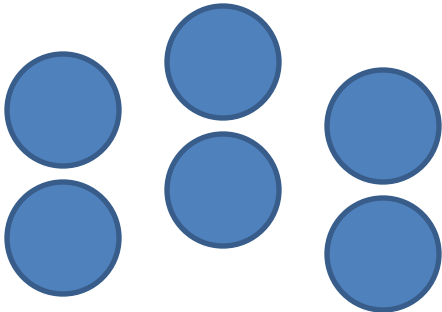
Chestnut Production

- What spacing and pruning method is best for Missouri growers?
- Standard central leader pruning 30' x 30' (48 trees/acre)



Herbicide strip

Drip irrigation



Chestnut Production Guide to Support Growers

- ‘Qing’
- ‘Sleeping Giant’
- ‘Gideon’
- ‘Peach’ (for hobbyist)



by Ken Hunt, Michael Gold, William Reid & Michele Warmund

Chinese chestnut is an emerging new tree crop for Missouri and the Midwest. The Chinese chestnut tree is a spreading, medium-sized tree with glossy dark leaves bearing large crops of nutritious nuts. Nuts are borne inside spiny burs that split open when nuts are ripe. Each bur contains one to three shiny, dark brown nuts. Nuts are microwaved or boiled to help remove the leathery shell and papery seed coat, revealing a creamy or golden-colored meat. Chestnuts are a healthy, low-fat food ingredient that can be incorporated into a wide range of dishes—from soups, to poultry stuffing, to pancakes, muffins and pastries (using chestnut flour). Historically, demand for chestnuts in the United States has been highest in ethnic markets (Italian and Asian) but as Americans search for novel and healthy food products, chestnuts are becoming more widely accepted. The University of Missouri Center for Agroforestry conducts one of the nation's most comprehensive programs for developing the Chinese chestnut into a profitable orchard crop. There are three field studies, a repository with 55 cultivars, a cultivar trial, and a nut production orchard at the Center's research farm in New Franklin, Mo. Market evaluation and consumer research toward chestnuts is also conducted by the Center.

Chestnut Species

Three species of chestnut provide the basis for world-wide chestnut production—Chinese chestnut (*Castanea mollissima*), European chestnut (*C. sativa*) and Japanese chestnut (*C. crenata*). Chinese chestnuts are a medium-sized (40 ft.) tree often multi-branched and wide spreading. With both good cold hardiness (-20°F) and adequate tolerance to chestnut blight, Chinese chestnut is the best adapted chestnut for Missouri and surrounding states. The European chestnut is a larger tree (65 ft.), wide spreading and generally too blight susceptible to grow east of the Rockies and is not as cold hardy as the Chinese chestnut. Most chestnuts seen in grocery store chains are imported European chestnuts, primarily imported from Italy. The Japanese chestnut is a small to medium-sized tree (35 ft.) but lacks the blight toler-

ance and winter hardiness of the Chinese chestnut. European and Japanese chestnuts are grown commercially in west coast states where chestnut blight is not as pervasive and the climate milder. Chestnut species hybridize freely, resulting in many selected hybrid cultivars. Several Japanese x European hybrid cultivars are under test at the University of Missouri Horticulture and Agroforestry Research Center in New Franklin, MO, but long-term observation will be needed to determine if any have enough blight tolerance and climatic hardiness to be recommended for planting in Missouri.

Three *Castanea* species are native to the U.S., American chestnut (*C. dentata*), Allegheny chinkapin (*C. pumila* var. *pumila*), and Ozark chinkapin (*C. pumila* var. *ozarkensis*), but all three are very susceptible to chestnut blight attack. In fact, the devastation



Chinese chestnut is a medium sized tree with spreading habit and has attractive white catkins in late May and through June.

caused by chestnut blight (*Cryphonectria parasitica*) stem cankers has reduced American chestnut from a major timber species to a small understory tree. The Allegheny and Ozark chinkapins are multi-stem shrubs to small trees that produce small tasty nuts and make interesting but blight susceptible landscape trees that are also useful for wildlife.

Top Ranked Chestnut Cultivars 2006 - 2010

Nut weight (g), tree yield (lbs), selected cultivars

Cultivar	Year Grafted	Mean nut wt. (g)					Mean yield/tree (lbs)				
		06	07	08	09	10	2006	2007	2008	2009	2010
Mossbarger	1996	18.8	17.0	15.3	12.1	15.2	22.7	15.2	39.5	92.6	46.4
Kohr	1996	15.7	15.8	15.0	15.3	14.2	18.3	21.2	19.0	44.3	48.6
Sleeping Giant →	1996	15.0	16.4	15.5	14.6	13.6	15.0	18.7	33.5	58.0	48.1
Auburn Homestead	1996	14.0	17.6	11.8	10.3	15.9	40.1	13.7	44.1	84.0	50.8
Peach →	1996	17.5	17.5	17.2	18.1	17.2	8.6	8.6	29.1	48.9	10.2
Eaton	1998	17.0	15.4	13.4	13.1	12.0	11.7	7.1	18.3	36.6	34.6
Qing →	1999	19.5	12.5	12.0	11.6	17.8	32.0	82.7	82.7	100.3	88.0
Gideon →	1999	17.5	11.0	11.9	12.4	14.4	12.3	28.7	37.7	52.2	40.7
Perry	1999	13.2	10.5	9.9	12.8	10.8	37.3	39.7	50.0	56.7	76.9

To achieve 2,000 lbs per acre, annual yields must average ~40 lbs (18.1 kg) per tree

Insects

- Scout for foliage eating insects (potato leaf hopper, yellow necked caterpillar, Japanese beetles).
- Potato leaf hopper creates cupped, deformed leaves, find leaf hopper feeding on underside of leaf (early June)
- Sevin can be used as control. BT against caterpillars.
- **Chestnut weevil**. Controlled chemically with Sevin or organically (hot water bath).
- Chestnut gall wasp (big problem, not yet in Missouri).



Chestnut Weevil

- Once weevil finds orchard – build up quickly
- SANITATION: Pick up all nuts promptly to break insect cycle to delay/minimize insect buildup
- Next step: either spray Sevin in August and September -- OR -- use organic method hot water bath treatment



Disease

- Phytophthora root rot -when roots are water logged.
- Chinese chestnut is somewhat tolerant of root rot. Plant on well drained sites.



Growing Chestnuts - Fertilize

- Split application of fertilizer.
- Fertilize at bud swell (~April 1st) and at end of flowering (~June 20th).
- Fertilize 50% each time.
- Ammonium nitrate or urea @ 100 lbs actual N /acre
- Apply 0.1 lb actual N per tree per year of age.
- Example, 3 year-old tree gets 0.3 lbs actual N per tree

Weed Control

- Spring, use Roundup once weeds begin to compete with tree growth for moisture.
- During growing season maintain a relatively weed free zone, use Roundup as needed.
- Late August, no further weed control is used to permit winter annuals (henbit, downy brome “cheat”) to cover the soil for winter protection.

Harvest

- Harvest season early September to early October
- Different cultivars mature at different times.
 - Pick up nuts at least every other day to preserve nut quality (daily is better).
 - Size, wash / float, sanitize
- Promptly store nuts in a refrigerator (32° F or slightly above) in sealed plastic bags (one to two gallon bags work well) or mesh bags.



Harvest

- Hand harvest until crop size justifies need to purchase mechanical harvester.
- Seasonal labor is an issue!!!
Mechanized harvester will be required.
- Pay “by the bucket” for hand harvest (~0.50 cents per pound).
- Use “nut wizard” about \$45 each.
- Pecan cleaner to separate nuts from trash. Air separation (blower).
- Run through “size sorter”



Commercial Harvest Options Coming to Missouri in 2014!



FACMA Harvesters
from Italy
Cost ~\$30,000 -
\$150,000



Post Harvest

- Wash with Stor-Ox (H_2O_2) or dilute bleach wash (1%) to sanitize nuts.
- NOTE: bleach must be thoroughly rinsed off chestnuts prior to refrigeration and sale.
- When washing chestnuts, remove floaters.
- Store in refrigerated cooler $\sim 32^\circ \text{F}$.
- Store in refrigerator in plastic or mesh bags.
- Chestnuts are the UnNut. 50% moisture. They will mold if left unrefrigerated for a week.

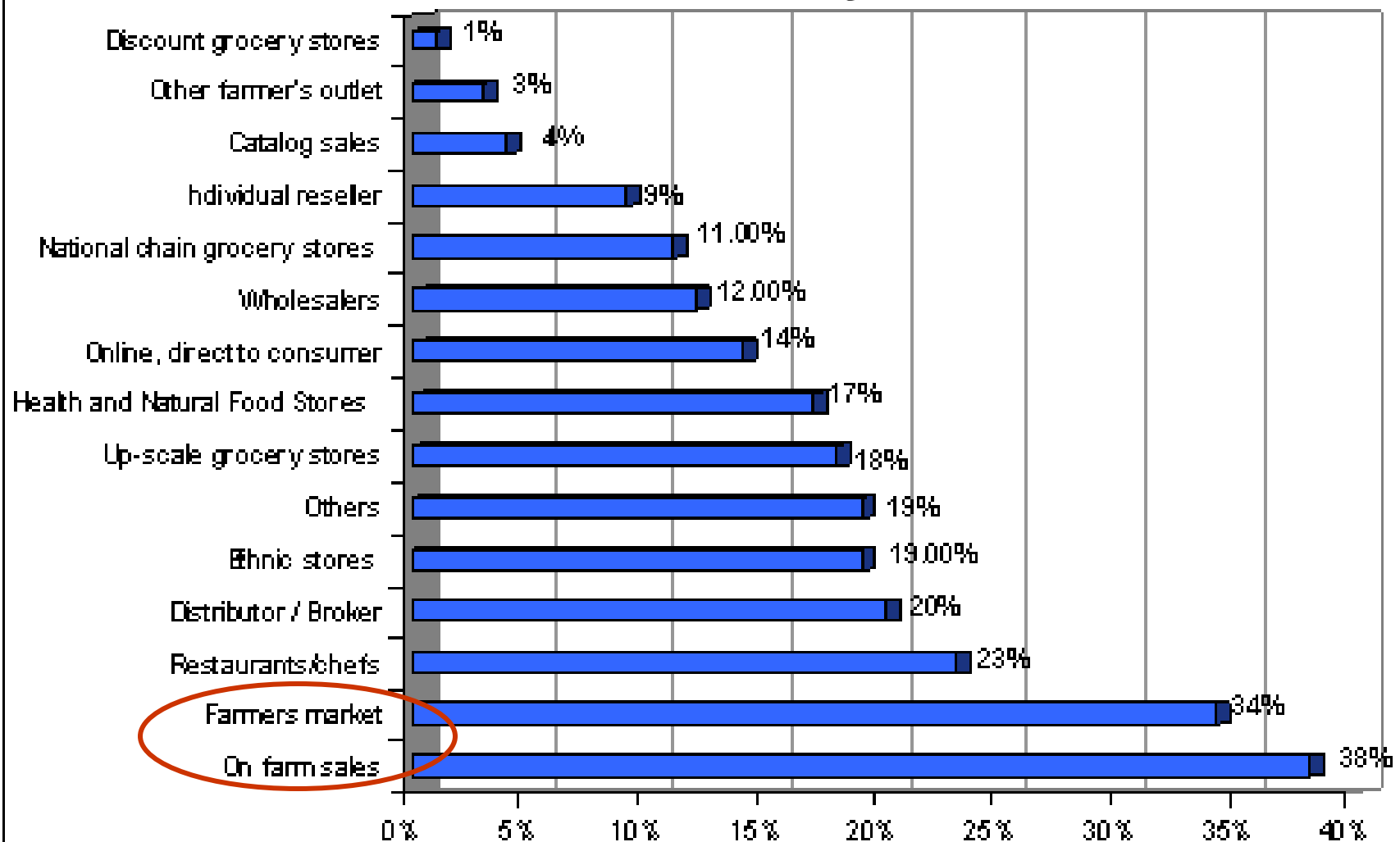
Chestnut Prices

- Full-time farming operations received better prices.
- Producers obtained higher prices if they:
 - grow chestnuts from cultivars
 - grow organic (pesticide free) chestnuts
 - grow large sized chestnuts (over 1 1/8th inch)
 - sell under a brand name
 - sell locally/regionally (“buy local” price premium)
 - sell direct to retail (but a ton of work)

Regional Chestnut Prices

- Clovers in Columbia, Missouri retailing locally grown chestnuts for \$5.25 per pound (wholesale price \$3.50 per pound)
- Chestnut Charlie sold direct to consumer at Missouri Chestnut Roast for \$4.50 to \$6.50 per pound depending on size
- Center for Agroforestry sells at Columbia Farmers Market for \$5.00 per pound.

Chestnut buyers



At present, most sales are fresh chestnuts

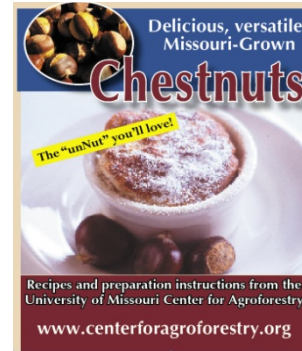
Consumer Surveys 2003 - 2009

Results

- Most participants **did not know** that chestnuts need to be **refrigerated**, are **very low in fat** and **gluten free**.
- The public and retail produce managers know little about chestnuts (must be kept refrigerated until eaten)
- Need to be educated about how to buy, store and prepare chestnuts
- Need information on nutrition and health benefits
- “**Locally grown**” very important to consumers (more important than organic)

Educate The Consumer

- Missouri Chestnut Roast – 2003-2010 to introduce chestnuts to the public
- Show consumers how to select, store and cook them
- Chef demonstrations
- In store recipes



NUTrition and Your Health *Chestnut, the "unNut" that's high in nutrition, low in calories!*

- Nutritionally, chestnuts are similar to whole grains and offer a sweet, subtle flavor.
- Unlike pecans and walnuts, chestnuts contain just a trace of fat, due to their high water content.
- Good source of fiber and cholesterol-free.
- Chestnuts contain just one-third the calorie content of peanuts and cashews!
- They are high in complex carbohydrates for energy.
- Chestnuts contain as much ascorbic acid (vitamin C) as

Nutrient composition of 1 ounce: (3 chestnuts/ounce) roasted chestnuts: (source: USDA, www.nal.usda.gov/fnic/foodcomp)	
Protein:	1.2 grams
Fat:	0.3 grams
Carbohydrates:	14.4 grams
Fiber:	1.4 grams
Vitamin C:	11 milligrams
Calories:	68
Cholesterol:	0
Sodium:	23 mg
Potassium:	606 mg

Also a source of magnesium and phytochemicals.
Learn more about the nutritional value of chestnuts, pecans and black walnuts at www.centerforagroforestry.org



Chestnut, Garlic & Mushroom Salad

Serves 5
1 pound live, hard-shelled
chestnuts, shelled
50g butter
200g olive oil
2 red onions, finely chopped
6 cloves of garlic, sliced
400g fresh chestnuts, peeled & halved
or 200g frozen peeled
200g button mushrooms, sliced
200g sweet brown mushrooms, sliced
200g portobello mushrooms, sliced
200g shallots, and onion stems, minced
and sautéed, sautéed overnight and
drained
1 teaspoon fresh thyme, finely
chopped
100g low fat yogurt
50g port
100g chestnut puree **
salt and freshly ground black pepper

Heat oil and butter in a heavy-based
frying pan and cook onion and garlic
for 5 minutes until soft. Add chestnuts
and mushrooms. Cook for 10 minutes
so chestnuts are cooked through but
haven't lost shape. Add thyme and
cook for a further 30 seconds.
Add yogurt, port and chestnut puree
and cook for 2 minutes, stirring all the
time. Season with salt and pepper to
taste. Serve on white leaves with
quail brown breast. Can be served
warm or cold.
* If you don't have fresh mushrooms try up
with a further 200g portobello mushrooms
** 300g fresh chestnuts (50g/100g frozen
peeled chestnuts) is best and covered with a
He stock water 100g of chestnut puree



Steamed Chocolate Chestnut Pudding

Serves 6-8
1 pound live, hard-shelled
chestnuts, shelled
500g chestnuts, peeled
5 cup vanilla
1/2 cup cocoa
2 cups milk
1/2 cup brown sugar
2 cup butter
2 eggs
1/2 cup aniseeds or sherry
In a saucepan, combine chestnuts, milk,
sugar and butter and cook slowly over
hot water for 10 minutes, stirring
constantly. Add peeled chestnuts and
eggs and stir well.
Preheat oven to 200°C. Peel chestnuts
using small sharp knife and leaving
inner skin. Place chestnuts in shallow
heatproof dish and bake 10 to 15
minutes, or until skin dries and peels off
easily. Rub cooled nuts in rough cloth
to remove skins. Place chestnuts in
butter a 1/2 liter bowl and pour in
mixture. Place the bowl in a pan of
hot water and bake in a moderate
oven 180°C for about 45 minutes
until pudding is firm. Unmould carefully
and serve with cream.



Market Outlets

➤ Festivals

✓ Great River Road Chestnut Roast – Forrest Keeling Nursery

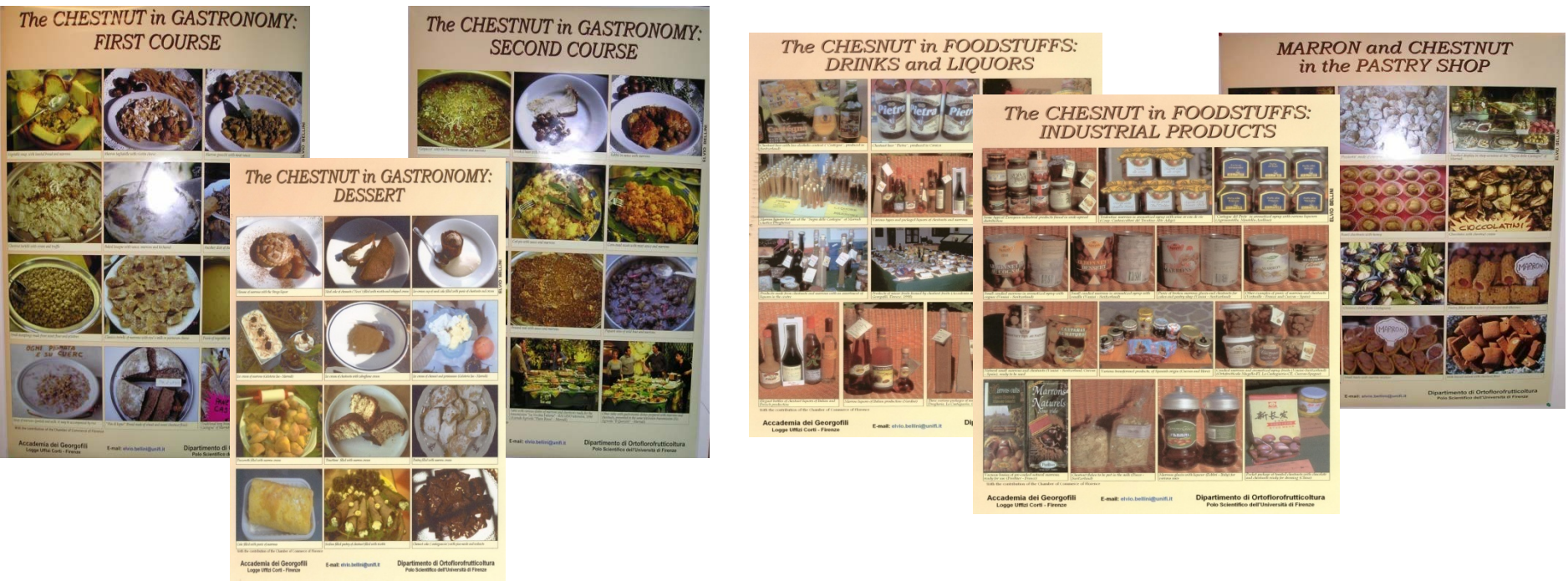
➤ Farmers Markets

➤ Retail sales: HyVee, Whole Foods, Hen House, Schnucks)



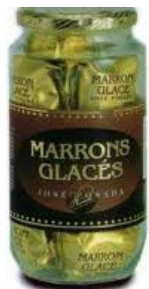
What do you do with chestnuts?

- Roast them fresh
- Dry and grind into chestnut flour: biscuits, lasagna
- Coat with chocolate or honey – marrone glace
- Make into a sweet puree
- Make into soups, dumplings, breads
- Cook with: turkey, ham, rabbit, roast beef, wild boar
- Ferment into beer, liquors



Future Market Growth

- Create value added products
 - **Chestnut flour** (gluten free) and associated product mixes
 - Baked goods
 - Chestnut puree
 - Chestnut honey
 - Peeled frozen
 - Chestnut beer, liquor
 - Chestnut (acorn) reared pork products



New - Coming in 2014

Growing Missouri's Chestnut Industry - Harvesting, Marketing and Financial Decision-Making

- (1) Mechanized harvest demonstration workshops;
- (2) "Time-and-motion" study to quantify the labor saving benefits of a commercial harvester;
- (3) Create, demonstrate and release a Chestnut Financial Decision Support Tool to help chestnut growers and other decision makers (e.g., cooperatives, agricultural lenders) make financially sound management and investment decisions; and
- (4) Provide advanced financial and market information to enable growers to profitably sell their chestnut crop

5. Create Chestnut Financial Decision Support Tool\$

Coming within the year...

Chestnut CFDST v1.0 - Microsoft Excel

File Home Insert Page Layout Formulas Data Review View Add-Ins

Clipboard Font Alignment Number Styles

Calibri 11

General

Normal Bad Good

Check Cell Explanatory... Followed Hy...

W32

Chestnut Financial Decision Support Tool - CFDST

Version 1.0

Establishment Decisions:

Site Prep:

Spacing (Ft): x

Layout/Design:

Site Quality:

Planting Stock: Graft Technique:

Fertilization:

Tree Staking:

Irrigation system:

Harvesting and Marketing Decisions:

Harvest Method:

Expected Rate of Return: enter a percentage return for this investment

Expected Price/lb for nuts:

Total number of Acres in Chestnut:

For more information about Establishment, Management, Harvesting and Marketing of Chinese Chestnuts click on the following link:

[UMCA Chestnut Guide](#)

Management Decisions:

Thinning: Enter a % of trees removed (i.e. 50%, 33%)

Fertilization:

Pruning:

Weed Control:

Pest Control:

Disease Control:

Deer Control:

Financial Results

Based on the information that was entered in the model, this Chinese Chestnut Orchard will have the following financial performance over a 70 year period:

Initial Number of Trees/ac	48.4	484 on 10 acres
Expected Price/lb for nuts	\$ 3.50	
PV of Revenues/ac @ 5%	\$32,707.04	\$327,070.44 on 10 acres
PV of Costs /ac @ 5%	\$15,538.92	\$155,389.19 on 10 acres
NPV/ac @ 5%	\$17,168.12	\$171,681.25 on 10 acres
Rate of Return (MIRR)	9%	
Years to Break Even	5	
AEV/ac @ 5%	\$906.96	

Management Input Cost Budgets Financial Analysis Input Tables Chemical costs Growth models

Join the Chestnut Growers of America



Chestnut Growers of America

(formerly known as Western Chestnut Growers' Assn.)
Your Resource for Chestnuts and the Chestnut Industry

HOME RECIPES NUTRITION HISTORY EVENTS GROWERS MEMBERSHIP CONTACT

NEWS AND EVENTS

CGA Annual Meeting and North American Chestnut Farm Workshop

Aug. 30 - Sept. 2, 2012
Jackson, MI

Fifth International Chestnut Symposium

Sept. 4-8, 2012
Shepherdstown, WV

National Chestnut Week

Sunday, Oct. 14-
Saturday Oct. 20
2012

Look for chestnut festivals
and other special events in
our out

American Grown Chestnuts ... ask for them in your store

You'll find them at the orchard or in your local supermarket from
September through December. Ask your produce manager to
make sure they were grown in the U.S.

You can also buy direct from many growers. Go to
"GROWERS" and select "DIRECTORY" to find a grower in
your area of the country.



Chestnut Growers of America

represents chestnut growers, researchers and others throughout the United States and Canada. They advocate the delivery
of high quality chestnuts to the marketplace and to your family's table.



Vol. 7, No. 4 Published by Chestnut Growers of America (CGA) Fall 2006

A Perspective on Chestnut Handling and Peeling

By Daniel Cooper, professor, Michigan State University, a major
contributor to the chestnut industry. He has published in
the Journal of Food Science, the Journal of Food Protection,
the Journal of Food Quality, and the Journal of Food Safety.

Source: Northern Horticultural Association (NHA) 19th Annual
Report - 2005. To view tables, see report page.

Introduction
A few years ago developing chestnut markets beyond fresh market
and seasonal sales in the United States to peeling chestnuts, a
product destined for processors as well as for export, was the
"white elephant" problem, and this report examines the
"white elephant" problem and its solution. It is a review of
the chestnut industry in the United States and its potential
as a major export commodity. It is a review of the chestnut
industry in the United States and its potential as a major
export commodity. It is a review of the chestnut industry
in the United States and its potential as a major export
commodity. It is a review of the chestnut industry in the
United States and its potential as a major export commodity.

In the peeling process, the goal was to maximize the percentage
of whole nuts, maximize percent recovery, or meet a certain
quality ratio with the chestnut. There generally is a trade-off
in maximizing one of these goals. In the example, maximizing
the percentage of whole nuts may come at the expense of the
percentage of whole nuts. Maximizing the percentage of
whole nuts may come at the expense of the percentage of
whole nuts. Maximizing the percentage of whole nuts may
come at the expense of the percentage of whole nuts.

The objective of this study, which is part of a broader study
to develop a chestnut industry following a market-driven approach
in contrast to one that is more traditional and product-driven,
was to evaluate chestnut and peeling variables which impact peeling
efficiency and effectiveness.

In this issue:

- 1. A Perspective on Chestnut Handling and Peeling
- 2. Chestnut Growers' Impact on the
- 3. Annual Meeting Highlights
- 4. Expanding the American Chestnut Industry
- 5. Our Chestnut Growers' Annual Meeting
- 6. Chestnut Tree Care, Part 1
- 7. Chestnuts in the Press (Five Issues)



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Secondary Nut Production: A Curious Phenomenon

Chestnuts, like the producers who grow them, sometimes
take much longer to reach a whole new level.

In August, producers Dale and Linda Black, Rockport, Ill.,
opened secondary harvesting on several of their trees - and
were very surprised. This was among the late season
production of chestnuts, but the trees were very young. The
trees were very young. The trees were very young. The trees
were very young. The trees were very young. The trees were
very young. The trees were very young. The trees were very
young. The trees were very young. The trees were very young.

Dr. Nicholas Wenzel, Plant Sciences Faculty and Center
for Agroforestry Research, University of Illinois at Urbana-Champaign

Evolution of U.S. Chestnut Imports

In this article, the history of chestnut imports from the
U.S. Europe and Asia are presented. Author: Dr. Michael
Gorman, Market Research Specialist, University of
Missouri Center for Agroforestry

These efforts are in progress to increase production and
consumption of chestnuts. The United States imports
an average of 4,500 tons (10 million pounds)
of chestnuts annually, mostly from Italy and China. The
quantity of U.S. imports of chestnuts varied from 2,951
metric tons (10.8 million pounds) in 2001, to 4,544 metric
tons (10 million pounds) in 2003, peaked at 5,996 metric
tons (13.7 million pounds) in 2004 and decreased to 4,479
metric tons (10 million pounds) in 2005 (see Fig. 1, pg. 5).

and subsequent use yield the following: one may be
offered, to chestnut, most other uses, like apples, peaches,
or walnuts, generally favor only more per season.

The Blackstons opened a 150-acre farm, located 7 miles from
the Mississippi River in Illinois. Chestnut trees make up
40 of these acres, with 2,500 chestnut seedlings planted
in a combination of plant seedlings in seedlings and
in the ground. Initial nut production began in 2003.
The Blackstons estimate secondary harvesting has appeared on
10 acres of the farm, with 10,000 chestnuts showing the
production more frequently. Trees more often are eight
years old with secondary harvests appearing throughout the
time. Approximate number of trees in 10 to 17 per inch.

Dr. Nicholas Wenzel, Plant Sciences Faculty and Center
for Agroforestry Research, University of Illinois at Urbana-Champaign

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Questions?

