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Chestnut Growers of America

Promoting Chestnuts and Connecting Chestnut Growers

The Chestnut Grower

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Overview of the 2024 CGA/NNGA Joint Conference

July 21-24, SUNY-ESF, Syracuse, NY

In This Issue

Mark your calendars for the 2024 CGA annual meeting to be held jointly with the Northern Nut Growers Association in Syracuse NY, from July 21st-24th. The planning committee assisted by Andy Newhouse (aenewhou@esf.edu) of SUNY-ESF is busy exploring on-campus and local opportunities for the conference. The next issue of *The Chestnut Grower* will include details about events, list of presenters, lodging, and registration. We plan to offer an early bird discount if you register before June 15. Watch your email to see periodic updates as the planning committee firms up the program.

The conference will begin with registration on Sunday afternoon, July 21, followed by a welcome reception that evening. Both NNGA and CGA will hold board meetings on Sunday and business meetings later in the week. Anticipate the traditional Sunday evening Show & Tell, Monday evening auction, and Tuesday evening banquet.

We are planning for all-day technical sessions on Monday and Tuesday, opening with keynote presentations by Andy Newhouse (ESF) or Hill Craddock (University of Tennessee). Expect to hear multiple presentations from members of ESF's American Chestnut Research and Restoration Project (www.esf.edu/chestnut) and other local experts. This year we are planning for 10-minute lightning talks and 30-minute technical presentations.

Anticipate there will be a CAPS program featuring local attractions in Syracuse and nearby.

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The Chestnut Grower

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About Chestnut Growers of America, Inc.

The purpose of Chestnut Growers of America is to promote chestnuts, to disseminate information to growers of chestnuts, to improve communications between growers within the industry, to support research and breeding work, and generally to further the interests and knowledge of chestnut growers. CGA advocates the delivery of only high-quality chestnuts to the marketplace.

CGA began as the Western Chestnut Growers in 1996 in Oregon where about 30 or so chestnut growers understood the need to join forces to promote chestnuts in the U.S. Eventually they realized that they needed to be a national organization and solicited memberships from every grower in the country, which took the membership to over 100. The name of the organization was changed to Chestnut Growers of America, Inc., and it was granted 501(c)(5) status. Annual meetings take place around the country in an effort to make it possible for a maximum number of people to attend. A newsletter, *The Chestnut Grower*, is published quarterly and distributed by mail and/or email. CGA maintains an extensive resource site available only to members containing information helpful in growing and marketing. Visit chestnutgrowers.org for more information.

Annual Membership Dues

Single membership, $45; Household membership, $55; Associate membership, $60. Members receive *The Chestnut Grower* quarterly. Emailed newsletters are included. Mailed newsletters are an additional $5 per year. A $10 late fee is applied to membership renewals submitted after April 1.

Advertising Rates

Full page	$20.00
Half page	$15.00
Quarter page	$10.00
Business card (4 issues)	$15.00
Classifieds	**FREE**

Email ads to chestnutgrowersofamerica@gmail.com. Send payment for ads to Jack Kirk, 2300 Bryan Park Av., Richmond, VA 23228. Make checks payable to Chestnut Growers of America, Inc. OR visit www.chestnutgrowers.org/paydues.html to submit payment online via PayPal.

Editorial Opinion

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Message from CGA President Roger Blackwell, Chestnut Grower

Hello Chestnut Growers of America,

Happy New Year, and I hope all of you had a prosperous chestnut harvest last year.

In this message, I want to let you know the plans for the next annual meeting. We will be meeting jointly with NNGA for 2024. The conference is scheduled for Sunday, July 21 through Wednesday July 24, 2024, at the Collegiate Hotel in Syracuse, New York. Please read this newsletter for additional information about the annual conference. We will have more information in the next issue for everyone's planning schedules.

This newsletter is an extended combined Fall/Winter issue. Charles Novogradac (Chestnut Charlie) will be telling us about his experiences with herbicide drift damage. Melanie Jones will be interviewing Greg Miller on her podcast. Greg has a lifetime of knowledge he shares with you about chestnuts and how he has grown his chestnut business. A preview of the upcoming joint NNGA/CGA Annual Meeting in July will be presented. Information will be provided for your annual membership renewal for CGA. Treasurer/Secretary Jack Kirk will give the annual financial report for CGA.

I am asking each Board Member to participate in providing an article for the CGA newsletter on a rotating basis. It should take two years in rotation to have one Board Member each make a submittal of an article concerning chestnuts and the industry.

CGA wants to thank the individuals who have submitted articles for this newsletter, and I encourage others in our organization to provide articles for future newsletters. We are all learning each year something new about growing chestnut trees in orchards throughout the country.

Best regards,

Roger V. Blackwell

New Fruit & Nut Compass farm planning tool can help producers project costs and returns of up to 12 perennial crops over 15 years

The Fruit & Nut Compass is a new farm business planning tool from the Center for Integrated Agricultural Systems (CIAS) at the University of Wisconsin – Madison to help both new and experienced producers project the financial costs and returns from an enterprise focused on perennial crops. It is available as a free, downloadable Excel file. The Fruit & Nut Compass is very different than a standard crop enterprise budget because it enables a person to examine the complete costs and expected returns of up to 12 crops, simultaneously, as part of an integrated farm plan over a 15-year time period. The tool is designed as an "open workbench" where the user enters information based on their specific plans to assess whether their enterprise will be profitable. It does NOT include any assumptions about crops, yields, costs or selling prices…those are all data entry tasks for the user. The main questions this tool helps the user answer are: ***how deep of a financial hole will I be digging, and when might my perennial crop farm become profitable?***

Why this planning tool?

Most of the Compass decision-support tools that CIAS has created are backward-looking in that they ask a producer to enter information on the previous year in order to parse out what crops or enterprises were more profitable than others. When CIAS and collaborators began the project that resulted in the Fruit & Nut Compass, it was decided that a tool was needed to help those interested in perennial crops better understand the significant up-front costs of establishment and the lag time between planting and actually having a crop to take to market.

Many perennial fruit and nut crops take 3 to 7 years to mature and yield at maximum potential. Consequently, anyone planning a farm that will feature fruit and nut crops needs to do careful planning to make sure they will eventually be profitable and recoup the cost of planting and establishment. The Fruit & Nut Compass provides the framework for a complete and careful examination before you start spending considerable time and money purchasing plants and necessary infrastructure. By using the Fruit & Nut Compass, a new or beginning grower can rigorously test and tweak their plan to help ensure financial success.

Key features of the Fruit & Nut Compass:

Examine up to 12 crops, simultaneously, as part of an integrated farm plan over a 15-year timeline.

- Step-by-step approach walks user through all potential expenses.
- Offers the option of listing expenses and revenue from temporary, secondary enterprises that might take place on the land where perennial crops are grown (such as alley cropping, grazing animals, etc.) in order to generate income while perennial shrubs or trees are developing and not yet providing income.
- Year-by-year yield projections that the user enters allow you to reflect reality in your enterprise plan as many crops will gradually ramp up in terms of yield

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Mark Your Calendars!

For the 2024 Annual Meeting, a joint meeting with the Northern Nut Growers Association (NNGA).

July 21-24, 2024

Syracuse, New York

Register Here
bit.ly/nngacga2024

Book Your Hotel Room at the Group Rate
bit.ly/grouprate2024

Happy New Year!

Your 2024 membership dues are now due. You have two options:

Renew Online

Download a fillable form from the CGA website at www.chestnutgrowers.org/CGA_Membership_Application_fillable.pdf. If you receive the e-version of the newsletter, the form is also attached to that email. Complete the form and email it to Jack Kirk, CGA secretary/treasurer, at jackschestnuts@gmail.com. You can then pay your dues through the CGA website by visiting www.chestnutgrowers.org/paydues.html. Please make sure you submit both your renewal application and payment at the same time. *~OR~*

Renew by Mail

Fill out, detach, and return the membership renewal form included with this issue on page 21. Send the form with a check made payable to Chestnut Growers of America, Inc. to Jack Kirk, 2300 Bryan Park Ave., Richmond, VA 23228.

***Renew Today** - A $10 late fee is applied to renewals submitted after April 1. If you are a new member who joined after August 1 of last year, your dues are already paid for this year, so no action is needed at this time.*

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On Wednesday, July 24, we are planning an all-day field tour. As is tradition with CGA, we will carpool or drive our own vehicles to the field tour sites. In the morning Andy Newhouse and staff will provide a short campus laboratory tour at ESF followed by a field tour at the ESF's chestnut field research site.

After lunch at the research site, we can choose whether to check out the hazel/chestnut orchard and seedlings at Z's Nutty Ridge, dig into the operational details of a producing orchard of cold hardy Chinese/Chinese hybrid chestnuts for zone 5b at Finger Lakes Nut Farm, or participate in a tree to table black walnut experience at Black Squirrel Farms in Penn Yan 70 miles SW of Syracuse. The other sites are 30 to 40 miles south of Syracuse. We are also looking into local options for post-conference stops as you head home on Thursday.

On-campus residential housing is not available. The conference headquarters will be the Collegian Hotel, which is less than a mile from ESF. Group rates (single or double occupancy) will likely be $115 plus 15% taxes per night. We expect to book a block of rooms for Sunday, Monday, and Tuesday night and a small block of rooms for Saturday and Wednesday night. If flying, plan to fly into the Syracuse Hancock International Airport (8 miles from the hotel) and take the shuttle to the Collegian Hotel.

Finally, please share this information with non-member friends and colleagues.

Call for Presentations

The planning committee is looking for a few more folks, especially growers, willing to do a poster, lightning talk (5 min presentation plus 5 min Q&A) or a technical presentation (25 min PowerPoint plus 5 min Q&A). If you have an idea for a presentation, contact Jerry Henkin (sproutnut@aol.com). Expect to submit a short abstract and bio for the program and a supporting article for a future newsletter.

Support the Auction

Now is the time to be thinking about possible items you could offer for the Monday night auction. Proceeds from the auction support the research grants program. Items in the past have included gift certificates, seedlings and grafts, shelled and in-shell nuts, historical documents, artworks, tools, candy, baked goods, and fermented beverages. In 2023, we had 32 items from 13 donors that generated more than $2,590 for the research fund. Let's see if we cannot improve on these numbers.

Exhibitors Wanted

Do you provide a product or service useful to nut tree growers, processors, or enthusiasts? Consider doing a staffed exhibit (includes full registration) or stand-alone display (small fee for table). Contact Carl Albers at 607-346-5226 or cwalbers@yahoo.com for more information and to be added to the list.

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over time. This also allows the user to build in and see the impact of a year with reduced yield or a crop failure.

- All expense information is entered in "per acre" units making it possible to alter the plan later in terms of planting size without adjusting every expense or revenue estimate.
- Although the tool utilizes acres as the primary unit of land measure, less than acre plantings are accommodated and perfectly acceptable.
- Final page presents user with a "dashboard" where they can tweak yield and selling prices to see how those changes affect the bottom line over the 15-year planning period.
- Tool is "agnostic" in terms of crops which allows you to create a plan based on your own research, reflecting the realities of your location, your growing techniques/systems, local markets, and your own marketing plan.

How to Use the Fruit & Nut Compass

The Fruit & Nut Compass is an Excel spreadsheet. It has been created, formatted, and protected so that it does not require advanced computer skills to use. If you are new to or unfamiliar with Excel spreadsheets, we recommend learning the very basics of Excel prior to using this tool. You will need to know how to navigate within an Excel spreadsheet workbook and how to enter data.

Visit cias.wisc.edu/our-work/farming-systems/farm-viability/fruit-nut-compass/ to download the tool. It is free to access and use. We do require that you answer 3 questions to help us understand who is using the tool and to provide an email address so that when we update or improve the tool we can notify users.

This tool was conceived and designed by John Hendrickson, Matt Raboin, Jim Munsch, and Leah Potter-Weight in collaboration with the Savanna Institute for the University of Wisconsin. Questions or comments can be addressed to John Hendrickson at jhendric@wisc.edu.

Article reprinted from the CIAS website (cias.wisc.edu).

Nutrient-Rich Chestnut Soups For Fall And Winter

Submitted by Melanie Jones, United Chestnuts

As the seasons shift and the air turns crisp, there's no better way to embrace the beauty of fall and winter than with a warm, hearty bowl of soup. If you're looking to add a nutritious and flavorful twist to your soups, consider the humble chestnut. Chestnuts, available seasonally, not only bring rich, creamy flavors to your dishes but also offer an array of essential nutrients. Here are three delectable chestnut-based soup recipes that are perfect for autumn and winter.

Creamy Chestnut and Mushroom Soup

Indulge in the sumptuous Creamy Chestnut and Mushroom Soup, a gluten-free and vegan delight that's remarkably simple to prepare. This soup not only warms your heart but also nourishes your body with its nutrient-rich ingredients.

- 2 cups chestnuts (fresh or canned)
- 2 cups mushrooms, chopped
- 1 onion, finely diced
- 4 cups vegetable broth
- 1 cup coconut milk (or any non-dairy milk)
- 2 cloves garlic, minced
- 2 tbsp olive oil
- Salt and pepper to taste

1. Heat olive oil in a large pot. Sauté onions and garlic until translucent.
2. Add mushrooms and chestnuts, cooking until they start to brown.
3. Pour in vegetable broth and bring to a boil. Simmer for 15 minutes.
4. Use an immersion blender to puree the soup until smooth.
5. Stir in coconut milk, salt, and pepper. Heat until warmed through.
6. Serve hot and garnish with fresh herbs or a drizzle of olive oil.

Roasted Chestnut and Butternut Squash Soup

Experience the essence of fall with this Roasted Chestnut and Butternut Squash Soup. This recipe combines the natural sweetness of butternut squash with the nutrient-packed roasted chestnuts.

- 2 cups roasted chestnuts
- 3 cups butternut squash, cubed
- 1 onion, chopped
- 4 cups vegetable broth
- 2 cloves garlic, minced
- 2 tbsp olive oil
- Salt and pepper to taste
- Fresh sage leaves for garnish

1. Preheat your oven to 400°F (200°C). Place the chestnuts and butternut squash on a baking sheet, drizzle with olive oil, and roast for 30 minutes or until tender and golden.
2. In a large pot, sauté the onions and garlic in olive oil until translucent.
3. Add the roasted chestnuts, butternut squash, and vegetable broth. Simmer for 20 minutes.
4. Use an immersion blender to puree the soup until silky smooth.
5. Season with salt and pepper, and garnish with fresh sage leaves.

One more recipe on page 19...

Melanie Jones of the Branching Out Podcast Speaks With Greg Miller

Greg Miller Reflects on the History & Future of the Industry

The "Branching Out" podcast, hosted by Melanie Jones, co-founder of United Chestnuts (unitedchestnuts.com), is an exciting new addition to our community of chestnut growers. Greg Miller of Empire Chestnuts and Route 9 Cooperative was featured in a recent episode. Enjoy his valuable insights in the episode transcription below. (This interview has been edited slightly for clarity.)

Welcome

Melanie Jones: Welcome back, Chestnut Enthusiast, to another exciting episode of Branching Out, the podcast dedicated to the thriving Chestnut Community. I'm your host, Melanie Jones, and today we have a true luminary in the world of chestnut cultivation and innovation. Our guest is a long-time industry leader who has been instrumental in shaping the landscape of chestnut production. Join me in extending a warm welcome to Greg Miller, hailing from the heartland of Ohio and representing Empire Chestnuts and Route 9 Cooperative. Greg's extensive experience and passion for all things chestnuts are sure to offer us a wealth of insights, so whether you're a seasoned chestnut aficionado or just nutty about learning, you're in for a treat. Let's dive into the fascinating journey of Greg Miller in the incredible world of chestnuts.

Introduction

MJ: Well, hey, Greg, how are you?

Greg Miller: Hi, doing just fine.

MJ: So, it's that time of the year when we ask – are you ready for some chestnuts?

GM: Yeah, they're coming ready or not. It's always an exciting time of year - the anticipation.

MJ: Absolutely. Well, thank you for joining the Branching Out podcast, Greg. I think most people listening to this know that you are a legend in this industry. I know firsthand going to events - I see the line of people standing there to get a few minutes with you, so I really appreciate you joining.

Greg's Story

MJ: Would you first just share what your story is - where's the beginning, and where do we end up now, in a short version?

GM: A short version is that my father bought the farm where I live as a hobby farm in 1957 and planted some chestnut trees there. He was actually interested in planting all kinds of trees, mostly nut trees, and over the next decade or two, we discovered that the chestnuts were doing much better on our land than the other nut trees. So he actually bought another piece of property in 1971 which is near where our co-op building is, just to plant more chestnuts. So to some extent the chestnuts chose me, because they did well on the land. Since then I've realized they don't do so well everywhere, so it was fortuitous that the land we bought happened to be good for chestnuts. When I was finishing up my PhD at Iowa State, I was sort of inspired by Wes Jackson from the Land Institute, and I decided that what I wanted to do is take my dad's hobby of growing nut trees and see if we could make that a commercially viable operation. I like to say that my dad's hobby got out of control and became my business.

MJ: And now you're passing it along to the next generation, and we'll talk about [your daughter] Amy in a minute.

GM: Right, it was mainly a hobby that became a business.

MJ: Did your dad want to sell the chestnuts, or was it really him enjoying the land and different kinds of trees and so forth?

GM: Yes, I think my father really had no commercial interest. He only ever sold a few, and it was almost an afterthought, like, "Oh, now I've got these, what am I going to do with them?" He got into it like a lot of people do, just fascinated by growing, maybe like a rose grower or any kind of gardener or hobbyist – they do it because they love the plants, and they love the land. That's how he got started.

MJ: Was your PhD related to this industry?

GM: Yes, I got my Bachelor's and Master's in horticulture and plant breeding and then got a PhD in the Forestry Department in forestry genetics and breeding, so my background in horticulture and forestry and genetics and breeding was I think a really good setup for what I'm doing now.

Empire Chestnuts

MJ: Absolutely. So, at some point you started Empire Chestnuts. Let's talk about that first. What is the size and scope of it, and what are you doing there?

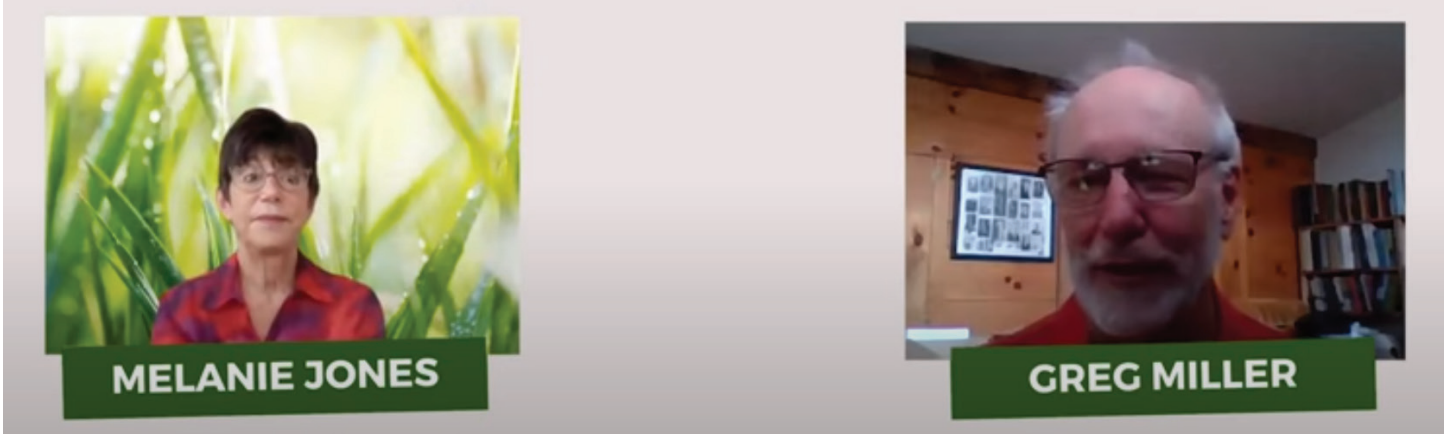
GM: When I came home to convert my father's hobby into a business, we already had the land, and we already had trees planted on it that were already in production. I just had to name the business. It got named Empire Chestnut Company because we live on Empire Road, and so it just sort of spontaneously developed. I didn't really have a clear plan of where it was headed because nobody had done this before. I enjoy that pioneering aspect, which is just being opportunistic and saying, "Oh, this is something we can do, let's do it."

MJ: Absolutely, and really truly right now in time, there's so many resources for people that are interested in growing to turn to because you and a few others have really paved the way. You had to figure things out along the way as far as the commercial business – sales and marketing and even processing, and there's a lot to that as well, so that's fantastic.

The Best Chestnut Tree to Plant?

MJ: One of the things we hear asked a lot in different conversations is, "What is the best chestnut tree to plant?" At Empire you have a diverse selection of trees - tell us about that.

GM: It turned out that the first 25 trees that my dad planted looked pretty good as they came into production, so then we actually planted our new planting of 500 trees as offspring from them. But I asked



the question after those 500 were planted - I wonder if there's anything better? I then began collecting chestnuts from wherever I could get them – a lot of them from colleagues and the NNGA. This was mostly before the internet, so when I got started it was kind of doing things the old-fashioned way with the telephone and by mail. I collected a lot of material with the help of a lot of other people. I was basically looking to see what's out there and asking answering the question, "Is there anything better than what I already have?" I think in the end I don't know that anything that I've found is any better than what I have, but there is certainly a lot of other good material, and so rather than say "this is what we're going to grow", we are still in in the business of asking the question if there is something better, and yes, there's a lot of material to look at, so that's what we're doing.

MJ: What were those first trees?

GM: They were from a nursery in Michigan called Ackerman Nursery which I heard later on from some person from Michigan that those Ackerman trees are the best there is - don't look for anything else. It did turn out that my father had planted Chestnut trees from a lot of other nurseries and the other stuff was mostly not very good, and so anything that doesn't look good to me meets a chainsaw. We have destroyed a lot of trees to maintain what we have. So, we kind of lucked out that the first trees we planted were actually really good from a genetic standpoint.

MJ: So, when do you know – when do you get the chainsaw out?

GM: How good a tree is depends on a large number of characteristics – the vigor and growth of the tree and maybe resistance to leaf insects. Those things can be determined fairly early before the tree starts producing. You'll see how soon it comes into production and what the quality of the nuts looks like. Those can be determined maybe within five or ten years. As the tree continues to grow, you keep finding out more about its characteristics, so there's no one time when you decide that the tree is good. But there's always one time when you can decide that a tree is not good enough.

MJ: That's right. How many different types of chestnut trees do you have at Empire?

GM: I think I'm planting seeds from at least 30 different named cultivars and then probably more than a hundred other parents that are just seedlings that look good. We keep planting those so the population of trees that I am evaluating or selecting is really dynamic. We're always eliminating trees and always planting new ones – as many as we can handle – you know, probably thousands.

MJ: One thing I'm curious about is how much time you spend running the nursery, the orchards, and all that and as opposed to scientific research and evaluation.

GM: I think that the distinction between what's research and what's production is not a very sharp line. I do think that the things that have an impact on my income or my expenses always take priority just because that's a constraint. But what I love to do is the evaluation and the development – the research parts of it. That's why I get out of bed in the morning. But then, you know, we have to make money just so I can get out of bed and do stuff tomorrow morning.

A Transgenerational Business

MJ: Maybe this is a good time to introduce Amy, your daughter. Here at United Chestnuts, we have some trees from the Chestnut Improvement Network, and one of them is 'Amy'. So, I wanted to make sure we talked about that - what is it like working with your daughter? She just finished her PhD. How is that?

GM: Oh, Amy and I have had a good relationship our whole life, and we get along well. She's a very independent person, and she does what she wants to do. Fortunately, she decided she wanted to be a part of this business. Her skill set and the way she works is I think very good for the transition from my kind of expertise, which is more engineering and development and research, and she's much more of a networker – able to talk to and invite people and work with the community more than just the technical aspects. So, it's a great difference that we have, but we also have a lot in common.

MJ: What a feeling, just to think that your dad started this, and then this has been your career, and now hers too. I mean, there's many people either in this industry or wanting to get into it where family is part of it, and I think that's so rewarding. The skills that Amy has are many, but the part of increasing awareness and generating demand is going to be really important the next number of years here in the U.S., so that as there are more growers, there are more buyers. Do you have any thoughts on that?

GM: Yes, the chestnut industry or chestnut business itself is such a long-term endeavor. It's definitely transgenerational. I was careful to not name my business with my name since the successor may or may not be my family, but I'm really feeling blessed that it is my daughter who wants to continue it, as well as other people. I think

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this kind of business really emphasizes the fact that one person's lifetime is small compared to a tree that can outlive people and certainly a business that requires decades to bring it into production and become a business.

Seedlings vs Grafted Trees

MJ: One of the topics in the industry right now is the comparison of seedlings versus grafted trees. You mentioned to me that you did a presentation and some research that we can maybe include in the United Chestnuts blog. What were your findings, and what are your feelings on that topic?

GM: There were a lot of us who at the beginning said, "OK, we need to have grafted orchards – that's the way all nut crops and fruit crops work." Or some other clonal production like rooted cuttings or tissue culture – there are lots of ways to create clonal orchards. The short version of a long story is that, at least for Chinese chestnuts, all of the vegetative propagation methods have been problematic. We discovered that there are limitations with seedling orchards, and there are limitations with clonal orchards. It turns out that for Chinese chestnuts, at this moment in time, the seedling orchards just outperform the clonal orchards, so for production purposes, if you want to make money, the seedling orchards seem to be easily the most profitable and the most reasonable way to go. A lot of people have argued about it, but there is very little supporting data. Ten years ago, we did make a new planting where we made alternating rows of seedling trees and grafted trees. It turns out that four of these rows, the longest rows in the planting, were a row of 'Peach'-'Qing' full sib offspring ('Peach' and 'Qing' are two cultivars), and between the 'Peach'-'Qing' offspring which are seedlings we put rows of both parents, so we have a row of grafted 'Qing', and a row of grafted Peach right adjacent to their offspring. We have begun collecting individual tree data on nut quality and yield, and at least for the first year's data, the seedlings have outperformed the grafted trees both in terms of quantity and yield and in nut quality. So, at least in this one little example, the seedlings are doing better.

MJ: That's great, I think. Having this kind of research for future generations is honestly going to be so important. I mean, we have seedlings in our orchards as well – some of them from you – at some point down the road. I will try to put a link to that study in this when we share it with everyone.

GM: You know, I would like to add that since my background is in plant breeding, that's my bias with which I look at everything. The seedling orchards provide an opportunity to continue the evolution and improvement of the crop, which has a long way to go. If you create a clonal orchard industry, then you're fixed in terms of genetic improvement. By planting seedlings, generation after generation, we can greatly improve the genetic quality of the trees, and having thousands and thousands of trees out there in seedling production orchards is an opportunity to really make advances, which we could not do if we were just planting clonal orchards.

MJ: Yes, for sure. We're involved with the Chestnut Improvement Network with the University of Missouri, and I like that some of the things they're doing is to try to track this data from different regions and different growers that bring this together in a more systemized way. I'm sure as a researcher that probably makes sense to you too.

Areas of Development

MJ: What are some areas of development that you've seen over, say, the last 10 years? Is it mostly things like what we've just discussed or say, operationally, like equipment? What are some of the developments that have come along since you started?

GM: Well, since I started and in the last 10 years are two different things, but on the other hand what's happened in the last 10 years or what's happened in 30 years is pretty much the same things. One of the most recent developments is Ron Revord starting at the University of Missouri and having an academic breeding program for chestnuts which has not existed up until this time. I was so glad when he got hired. He actually has the job that I wanted to have 35 years ago, but 35 years ago that job didn't exist. So, it's like now I have the chance to. When he got the job, I was 65, and I said, "OK, I'm 65 years old, now I can start a tree breeding program." Fortunately, I've got someone younger to actually see it through. I have been just thrilled to be able to hand to him what I've done over the last 35 years.

GM: The other thing that's been really notable in the industry is the interest in buying chestnuts to eat and the interest in people in the industry wanting to create products. The whole market for chestnuts, chestnut products, and chestnut trees is something that I have no control over at all, and it seems to have occurred spontaneously. That's a huge driving force to enable people like me to work in the industry. We don't have any trouble finding people who want to buy or want to plant. I think this is something that maybe other new crops don't enjoy as much – a huge demand already there that makes it easy.

MJ: That's right, I just think the information from you and a few others that has circulated gets people inspired. Your stories have inspired us to say, "Well, let us try to do that too." So, thank you for that. Also, Dr. Revord spoke so highly of you in a recent Branching Out podcast we did together, of you just being so unselfish with your time and your knowledge. Like I said, I've seen you stand and talk to person after person at events just unselfishly sharing what you've learned, and it's greatly appreciated. Hopefully we can continue to send buyers to make sure you're getting paid so you can get up out of bed in the morning.

GM: Well, I have to say that lots of people have freely given me information and genetic material. I always say that if I give away everything that I know and have, what that does or what that creates is the fact that maybe 10 or 20 or 100 people have given me everything that they know and have. So, there's a big net gain there, and I think that's the only way we as an industry can progress at a reasonable pace, if we all share, because the more we give, the more benefit there is that comes back many-fold.

MJ: I agree 100 percent. Let's circle back to the question you and we are asked frequently – what's the best tree to plant to start a chestnut orchard?

GM: Yeah, there's always this question of what's the best. Well, there is no best, and again, based on my bias as a plant breeder, I'm looking at populations, and I think we need to be planting a broad array of genetic material for a couple reasons, maybe the most long-term of which is we have to have variation in order to make improvement, and so therefore we need to plant a lot of stuff. I don't really know what the best is, and so we need to plant

Photo provided by Greg Miller.

an array just to discover what the best is. We have questions like, what about regional adaptation? Probably what does best in Georgia is not going to be the same as what does best in Upstate New York or Iowa or Wisconsin, so we need to sort through the material to find what is best adapted. I think even if we had much better evaluations and knew more about the material that is available – in any given orchard and in any given site, we have year-to-year variation, and I and others have seen this year these few trees do well, but next year it's another set of trees. By having diversity, we can kind of level out the production and the quality, and so I don't think we will ever get to the point where we say, 'this is the best.'

MJ: Hopefully not. Some people think there's a best, but I don't believe that we know. What is your very favorite part of this whole business?

GM: I guess that the thing that I get thrilled about is discovering new things and solving problems. It's just the kind of personality that I have that I like not knowing exactly what to do or how to do it and I feel the need to discover that and see new trees. I guess it's not only from what I see but when I get feedback from people like you and other people who are just excited to see what I have done, it's a real inspiration for me to see that not only am I doing something that's exciting to me, but it is interesting and exciting to other people too, and so it makes me feel like what I'm doing is worthwhile.

MJ: Absolutely. Dealing with the unknown is the magic of life – when we get up every day and we don't know exactly what's going to happen and what we're going to discover. I think dealing with trees and agriculture and so forth, it's kind of like that, so agreed.

Route 9 Cooperative

MJ: OK, let's talk about Route 9. So, you have Empire Chestnuts, your farm, and at some point, you started Route 9, so tell us about that and where people can buy product.

GM: A lot of things in my life and in my business have happened without me having any input or planning, and one of the things that happened was, of all people, a strip-mining company purchased land all around our farm and actually leased some coal mining rights. They then decided they wanted to get into the chestnut business and bought 8,000 trees for me and planted them. Four thousand of them survived to production age. The coal mining company went bankrupt, and the land got sold eventually to the current landowners. In the early 2000s these trees were coming into production, and I said to the new landowners that I would buy the chestnuts from them, and then within a few years the chestnuts from my neighbors were exceeding the production from my land. We had outstripped my capacity to handle those from a processing and marketing standpoint. I said we needed a new building, but I didn't want to just build it on my own and be dependent on their production. So, we actually got some skin in the game from the neighbors, and we all pooled resources and built the co-op basically because we needed it. We were already operating as a co-op, so it kind of developed on its own.

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MJ: Do you see your co-op expanding with other growers?

GM: We have already admitted a new grower in addition to the five founding members. With the facility that we have, I think we can easily handle about 200,000 pounds of chestnuts per year. Right now, we're at roughly half that, so we have the capacity to grow at the site we're at, and we could also expand to other sites as our business grows.

MJ: How far away do you think growers could be in a vicinity to have a co-op? Because I feel like there'll be more co-ops developed throughout the U.S. if this industry grows.

GM: There are two main advantages to having a co-op. One is the economy of scale of the handling – the cleaning, sizing, and hot water treating and then cold storage. Those all take equipment that's expensive, so it's nice to have a co-op to do that so the individual grower doesn't have to go to those expenses. The other advantage is the economy of scale of marketing. One of our growers is in Kentucky, a four-hour drive away, and one of the members of our co-op is two hours away from where we are. That's Bob Staley. Bob has over 100 acres in production. He has his own processing and cold storage facilities, so we mainly just help him with marketing. I think that the post-harvest handling facilities would be optimally set up to handle maybe 100,000 or 200,000 pounds, and then at some point it becomes not economical to transport chestnuts a long distance to that facility. I think we could have a co-op where there are numerous processing locations, but we still do the marketing collectively.

Chestnut Woodstock

MJ: Okay, that makes sense. You also have your Chestnut Woodstock coming up here pretty soon. Tell us about that.

GM: Yeah, that was another thing that sort of happened spontaneously. Amy called it the "Harvest Party". There were some new growers in Southern Ohio who were just planting trees and they said they wanted to know what it's like to harvest. They asked if they could come up and visit while we were harvesting, and Amy said sure, come on the first weekend in October. That's always the peak of harvest. Then through networking this few people visiting became 50 people, and everybody camped in the orchard, and it became this big social event where people brought food and music and spent the whole weekend harvesting and just having a good time.

Harvesting

MJ: How does that relate to how you harvest for the co-op? Are you using equipment, or how do you harvest?

GM: Harvesting is one of the critical aspects and critical needs of the business. We harvest by hand, and we get away with that because we are surrounded by Amish, and we hire over a hundred people every season to come basically pick up

Photo provided by Greg Miller.

chestnuts and put them in five-gallon buckets. We pay 17 to 20 dollars a bucket full. That takes about an hour, more or less, so we seem to have enough people willing to come pick up nuts and put them in buckets, but if there was another grower in our county the same size as us, there would not be enough labor, so there is a critical need for machines to do the job. The machines that exist I don't think really do it adequately, but as more and more growers find themselves with tons of chestnuts to pick up, there's going to be enough incentive that the engineers and equipment manufacturers will get to work on this problem and create machines to do it, and we really need that.

MJ: For sure. We have a lot of Amish around us, and we were visiting with one of them the other day, and they have like 14 kids, so I'm thinking that family can help, but you know it's a win-win because they don't use equipment.

GM: It is something that children can do and make money, and they seem to enjoy it. I just don't think there are enough Amish children or other people willing to pick up chestnuts to really expand the industry like it is expanding.

MJ: Yes, I know what you're saying that the equipment is key, especially since some of the orchards going in are larger size. When people come to the "harvest party", if someone wants seeds or nuts to grow trees, can they pick those up?

GM: When people come to the harvest party, that's mainly in an orchard that's like my "old" orchard, and they are picking nuts for culinary use. The seed trees that I have are kind of scattered all over and labeled. I harvest them myself, me and a few people dedicated just to seed harvesting do that. It would be logistically difficult to let people harvest their own seed nuts, so the harvest party people harvest culinary nuts, because it's just too hard to keep everything separate.

Seed Sales

MJ: So, if someone wants to buy seeds from you, do they go to route9coop.com?

GM: Yes, that's how I've sold seed, and the new problem that I've had the last two years is that the demand for seed and the demand for seedlings has suddenly skyrocketed to the point that I don't have enough, so I'm still dealing with this problem that I have more people who want it. The names of cultivars have become kind of well-known on the internet, and for a lot of these, the newest parent trees, there might only be one or two or three trees. There's not enough to produce hundreds of pounds of seed that people would like to buy, so we have a dilemma that there's more demand than supply for the seeds and trees at the moment.

MJ: That's okay – that's encouraging for a lot of newer growers, ourselves included, that there's this opportunity in the future. And it's never a problem – you sell out at the co-op, don't you, every year?

GM: Yeah, really since 1994 we have had more demand than supply, so we sell out of culinary nuts before we get done harvesting.

MJ: That's so great. I love that. There's not a lot of industries right now that can say that.

GM: I think we'd be hard-pressed to find any crop that we can grow in large areas of the U.S. that is still really under-produced. So chestnuts are kind of in a unique situation.

Recommendations for New Growers

MJ: Okay, last question is, do you have any recommendations for new growers, or especially people just looking to get into this business?

GM: I have that question all the time, and I think in order to succeed there needs to be four or five conditions met. For one, the potential grower needs to have a good site. Chestnuts are actually really picky about where they will grow. They need well-drained acidic soil. There are chestnuts everywhere in the world that are mountainside trees, and they need something like a mountainside to grow. There's a lot of flat land with heavy soils that do well for corn and soybeans that won't do well for chestnuts. So, you need a good site. Then, you need to plant the right genetic materials. I say I like seedlings, but not just any seedlings – only seedlings from exceptionally good parents will work. Then, it needs to be the right kind of person. I get a lot of people who want to know a lot about what the prospects are – everything about production, when am I going to break even, how much am I going to get per acre, and somebody who wants all that information before they venture into it – that might not be the kind of person we're ready for yet. It needs to be someone with a pioneering kind of attitude that can say, well, I don't really know what this is going to be, but whatever it is, I'm going to make it work. I think those growers who are succeeding are the kind of people who no matter what happens, figure out how to overcome problems and make it work and derive a lot of satisfaction from that kind of problem solving and pioneering attitude. The other thing is – because of all the things I just said – you've got to have the right land, the right material, and the right attitude – it takes time to get into full production, so there needs to be adequate resources for a person to do that – there's got to be some subsidy provided to provide the land and the pre-productive costs. I think if you're going to do this, it's a commitment for 25 years, and anybody who has succeeded has been in it for about that long.

Conclusion

MJ: That's right, you have to love it because it's a lot of work, and upfront costs can be significant. If you look at it, depending on the age range, it is generational, and you're giving back to not only maybe your family, but also to the earth, to planting more trees and helping with climate situations.

GM: Yeah, there are lots of reasons to grow chestnuts – for environmental and health reasons, but ultimately it somehow has to be economically sustainable as well as environmentally sustainable, and that's one of the difficult parts. You can't do it if you don't have adequate startup funding or land to work with.

MJ: Well, Greg, I sure do appreciate your time, your talent, your knowledge, and all that you do for our industry, so thank you so much.

GM: Well, thank you, because if it wasn't for people like you, I wouldn't be as happy and successful as I am.

MJ: Yep, that's a win-win.

Live and Let Die: Reflections After Herbicide Drift Injury

by Charles K. NovoGradac

INTRODUCTION

A strange pick-up pulled into my nut tree farm. The driver was the man I was hoping to hear from. He handed me a paper, his spray record, and said, "You must really hate me, just now."

This was mid-May 2022. I had observed leaves cupping, curling and twisting on trees near my north boundary. The neighbor's field was brown and dead. I had tracked down the farmer's mobile number and left a message explaining that I suspected herbicide drift. I had asked whether he had sprayed recently and, if so, when and what chemicals?

The young farmer was new to me and was taking over from retiring senior members of his family with whom I had tense conversations before. He was the fourth generation of a successful farming family which now leased many thousands of acres in our area, including land on three sides of my orchard. I was the new guy, having been there for only 27 years; and I was the weird guy, the tree nut farmer.

The farmer had responded quickly, respectfully, and in person. His spray application printout for his pre-soybean burndown listed four different chemicals tank-mixed together and sprayed about two weeks before. None were restricted use chemicals. One was 2,4-D, with no brand name and no indication whether ester or amine formulation. The farmer told me it was generic 2,4-D, all other kinds being out of stock from his dealer at the time. Per his records, the farmer had sprayed beginning 5:30 am (which was 10 minutes before sunrise) at 69 degrees F and 3 mph winds SE, away from my property. With those weather conditions, he believed there should have been no drift to my property.

I drove the farmer in my off-road vehicle to view the damage. My shelterbelt begins nine feet back from the property line. The weed-kill line on the ground from the farmer's spray was sharp and straight: brown on his side, green on my side (fig. 1). But, above ground, on my shelterbelt trees, I pointed out curling, cupping, and twisted leaves, most particularly on pecan and oak trees. The leaf curl was, I later learned, symptomatic of auxin herbicide damage, for example, 2,4-D or dicamba, systemic herbicides that translocate through the exposed plant and kill down to the roots (Stepanek, 2018).

Next, I took the farmer into the interior of my orchard where I showed him my chestnut trees. The herbicide had penetrated my shelter belt. Leaf cupping, curl, and twisting could be seen on chestnut trees 100 feet inside my property at eye level and up. Symptoms were most severe next to his field and diminished with distance, offering evidence that herbicide drift from his field was the source.

Before he left, I thanked the young farmer for his cooperation. I reminded him that the trees comprised my livelihood and my pension, and I warned him to be careful. For the present, I said, we would just have to wait and see.

I spent a great deal of time over the next several weeks doing research on: (1) How badly was the damage likely to be? (2) Could I or should I file a report? (3) Could I or should I file a lawsuit? (4) When herbicide applications are repeated year after year to nearby farms, can my tree nut orchard continue to prosper?

The purpose of this article is to share some of the information I have learned and some sources for further reading. I will reflect on how planters wishing to pursue an alternative agriculture of tree crops in the spirit of J. Russell Smith (1950) might manage or confront the risks of herbicide use by their neighbors.

WHAT TO DO AFTER HERBICIDE DRIFT DAMAGE?

After communicating with the neighbor farmer, I had to decide whether or not to report the herbicide damage to the State or visit a lawyer to pursue compensation. With some regret I did neither.

A local organic farmer friend, one of our area's few remaining market-gardeners, told me about his and other herbicide drift incidents in the area. Each incident had been obvious and verifiable, was traced to a specific herbicide application, and

***Figure 1.**—Shelterbelt-soybean field border two weeks after burn-down with an herbicide cocktail followed by no-till planting of soybeans (note drill tracks in field).*

involved annual specialty crops that could be valued. Most were settled between the parties and an insurance adjuster. My friend advised against filing an herbicide misuse report. My sense of my friend's reasoning was "live and let live."

Another friend, a non-farmer resident of an old homestead surrounded by farmland, was not so reticent when herbicide killed her fruit trees. The Department of Agriculture representatives' investigation actually identified chemical herbicides in the injured plant tissue samples and discovered a suspect herbicide application that had exceeded label amounts. But nothing came of it after that.

The first step for anyone injured by herbicide drift is to document the damage: date of the spraying or when the injury was noticed, record the areas or trees damaged with a summary of the symptoms. Take photographs and plant samples (Wells 2019, 2022). I took numerous dated photographs at identifiable locations on several different dates, including follow-ups.

Laboratory tests may confirm herbicides but are expensive and rarely used, according to some sources (Wells 2019, Missouri Botanical Garden). I found weather records archived by date at the Weather Underground website (www.wunderground.com) and checked wind and temperature at the time of spraying. Archived local newspapers can also be used for this purpose. Newspapers also contain weather forecasts of which a farmer should have been aware.

Every state has a pesticide regulatory agency to which pesticide misuse should be reported, usually a division of its Department of Agriculture (npic.orst.edu/reg/state_agencies.html). Incident reports may or may not be investigated. An investigation by the state will not generally award compensation for someone injured by pesticide misuse, but may result in a fine or misdemeanor charge against the applicator.

State laws commonly require or recommend that pesticide incidents be reported within a certain number of days after the damage occurs or is first observed. For example: Iowa is 60 days (Iowa State Statutes), Missouri is 30 days (Missouri Department of Agriculture), Nebraska is 90 days (Nebraska Pesticide Program), and my home state of Kansas is 60 days (Kansas State Statutes). According to Kansas Statutes (A), the failure to file a report "shall create a rebuttable presumption that the alleged damage did not result from the pesticide application".

A report requires notification of all parties. In my case that would mean bringing the entirely innocent, retired, elderly, and out-of-town owners of the sprayed field into the dispute between me and their farmer. That was not going to win me any good-will points with my neighbor owners. Even if the investigation proceeded, which I doubted, it was not likely to arrive at a conclusion as to fault and damages, making the effort pointless. On seeking restitution, whether from the farmer or his insurer, the bedrock test is whether you could prove a case for damages in court.

Recovery of damages has to be founded in some legal theory. Possible theories considered in varying states include strict liability, inherently dangerous activity, trespass, and nuisance. I would like to think that if a person releases a dangerous poison into the air that he would be held responsible absolutely for injuries it caused. To the contrary, most often the standard used for herbicide drift cases is negligence (Dowel, 2016). In the case of farmers, courts accept that some pesticide drift is inevitable (Titus, 2021). Also, public policy generally favors the activities of farming, and some state laws go to extraordinary lengths to protect the farmer. When a farmer has made an herbicide application consistent with the product label, under the negligence standard there is no liability regardless how his efforts may have miscarried.

The Kansas Right-to-Farm statutes (Kansas Statutes, B) protect established farmers by erecting higher standards in litigation and creating presumptions that ordinary farming practices cannot be nuisances. Actual damages are limited, punitive damages are disallowed. The Right-to-Farm statutes provide specific protection to farmers that use agricultural chemicals according to the label (Kansas Statutes, C). A plaintiff filing suit against a farmer in Kansas risks having to pay the farmer if he cannot prevail.

According to the Kansas Statutes (D), "Any case in which an action for injunction is brought alleging the prior misuse of agricultural chemicals and the court finds that the defendant properly used the agricultural chemicals according to state and federal law and the label instructions and that the plaintiff sustained no damages from the use of such agricultural chemicals, the court may assess against the plaintiff reasonable attorney fees and expenses incurred by the defendant as a result of such action. In addition, the court may assess against the plaintiff additional losses and costs incurred by the defendant upon proof that such losses and costs were the result of an injunction granted as part of such action".

Other states Right-to-Farm laws are collected and reprinted by the National Agricultural Law Center (nationalaglawcenter.org/state-compilations/right-to-farm).

AMBIGUITY ABOUT THE HARM BY HERBICIDES TO TREE CROPS

Although circumstances convinced me that my neighbor's 2,4-D application injured my trees, the potential legal jeopardy convinced me that I had better have a slam-dunk case both for the cause of injury and for actual damage before proceeding.

The Missouri Botanical Garden has a good website (www.missouribotanicalgarden.org) showing photographs of typical symptoms from different herbicides. Another good source explaining different herbicide modes of action, absorption, patterns of translocation, and symptoms, particularly on trees, is available through the Mississippi State Extension (Self, 2018).

It is important that one rule out self-inflicted injury from chemicals or fertilizers used. It is also possible to confuse natural tree diseases with herbicide injury. In my experience, damage by potato leaf hopper on chestnut trees in early summer looks very much like herbicide damage.

As to the issue of damages, and whether, and to what extent, trees are injured by herbicide exposure, I found mostly ambiguity in the published literature. For example, according to Brodbeck (2020), "once an herbicide has been absorbed, it becomes a waiting game to see how the tree will react and whether it will survive. Depending on the herbicide and the dose

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applied, this waiting period can range from a few weeks to several years". According to Self (2018), "Depending on the herbicide and the species exposed, greater levels of herbicide drift can cause tree mortality. Mortality and severe damage are especially prevalent in cases where multiple incidences of drift have occurred." Figure 2 may be an example of severe damage after multiple incidences of herbicide drift.

Yet another expert, Wells (2019), says "While no long-term injury may develop, each herbicide drift case is different and the level of injury is dependent upon the herbicide used, rate applied, wind speed and direction, timing, and the level of coverage obtained, any symptoms of injury should be documented as soon as possible after they are detected."

A one-season research experiment in Georgia tried to replicate real-world herbicide drift from neighboring agricultural fields by directly spraying mature pecan trees with dicamba or 2,4-D in different concentrations, and measuring what happened at different exposure levels (Wells *et al*., 2019). Pecan trees were seriously injured by both chemicals but yield was not affected; however, other reports from Georgia suggest that flower and fruiting are more sensitive to herbicide drift than tree growth (Wells, 2022). The Georgia research experiment did not purport to examine subsequent or long-term crop yields nor the effects of repeated herbicide exposure likely in an agricultural setting.

On the other hand, an expert pecan grower, author, and NNGA member from Oklahoma, Wesley Rice, described how exposure to 2,4-D herbicide from spray planes in the flowering period in May can ruin a season's pecan crop (Rice, 2003). He also noted that damage to leaves and dieback of one- and two-year twig growth further weakens a tree for years to come.

HERBICIDE USE AN OVERWHELMING REGULATORY PROBLEM

The herbicide dicamba has become particularly notorious over the past several years for off-site drift throughout the Midwest (Elmore, 2022). Bayer AG, parent of Monsanto, agreed to pay $400 million to settle claims for dicamba damage to soybean farmers (Morgan and Morgan, 2021).

***Figure 2.**—Chestnut tree slowly dying approximately 25 feet from neighbor's corn/soybean field that has been repeatedly sprayed. Thin area in shelterbelt may have created a wind tunnel increasing herbicide penetration.*

In 2020, a US Court of Appeals, revoking a dicamba product registration, found that the "EPA had substantially understated risks that it acknowledged and failed entirely to acknowledge other risks [of dicamba]" because of "political interference" (EPA, 2023). Even more disturbing, after the court decision, an apparently recidivist EPA approved three more dicamba products later that same year (Penn State Law, 2023).

My impression is that state agriculture departments, to which extension agents will send you first, are overwhelmed. For instance, the Nebraska Pesticide Program website states: "Due to the high number of dicamba herbicide claims the Nebraska Department of Agriculture (NDA) has received…NDA has developed the following priorities when determining whether an herbicide damage claim will be investigated…Direct and verifiable impacts on private property such as gardens, trees, lawns, or shared space," [emphasis added] is at the bottom of the Nebraska list (Nebraska Pesticide Program). If I grew trees in Nebraska, my claim of damage, obvious as it was to me, would likely never get investigated.

Although most dicamba complaints are for damage to annual crops, trees and tree crops have also been hard hit by dicamba. In one notorious example, *Bader Farms v. Monsanto, Bayer and BASF*, peach trees were damaged by dicamba in Missouri. The jury, apparently outraged at shocking internal documents from Monsanto, awarded the peach growers $250 million

in punitive damages on top of $15 million actual damages (Earls, 2022). Monsanto is trying to deflect blame, saying the farmers who used its chemical were the ones primarily responsible. The damage award against the chemical companies was reduced but affirmed at $60 million. Litigation is ongoing as of this writing to determine which affiliated chemical company is the more liable (Hettinger, 2023).

News reports and extension literature citing creditable government agencies, scientists and foresters now tell us trees are being damaged generally everywhere in the Midwest and the South from increasing use of volatile herbicides. Foresters in Nebraska consider herbicides, particularly dicamba and 2,4-D, to be the No. 1 problem harming trees. The full story, with background, including the Bader case mentioned above, is set forth by Hettinger (2020).

HERBICIDE INJURY OFF-SITE IS EXPECTED AND UNAVOIDABLE

According to Ogg et al. (2018), "It is possible for pesticides to adversely affect humans, animals, plants, and the environment, even when the label is followed to the letter."

The golden age of Roundup Ready is over. I started my tree project in 1995. A year later, in 1996, Roundup Ready soybeans were introduced, and my neighbors apparently adopted that herbicide system. For the first several years after 1996, while my orchard and my shelterbelt trees were becoming established, my neighbors' herbicides did not cause much visible damage outside of their own fields. Glyphosate by itself, as I understand it, works only when it lands on green foliage. It loses its punch on earth contact and has no residual effect in the soil. Glyphosate does not volatize badly and was not harmfully carried on dust kicked up by subsequent equipment work and wind.

But the bad old herbicides are now back in force in conventional agriculture. Weeds have, by survival of the fittest, evolved into herbicide tolerant super weeds. Higher, stronger doses are applied. More herbicides with different modes of action must now be combined by farmers to suppress super weeds (Brown, 2021).

Herbicide use on soybeans declined briefly in the late 1990s when Roundup Ready seeds caught on, but herbicide use has about doubled since 1996 (Elmore, 2022). Dicamba and 2,4-D, previously used mostly before seeding crops or for broadleaf control in lawns, pastures, and some orchards, are now also used as a post-planting, over-the-top, herbicide for genetically engineered (GE) herbicide tolerant soybeans. Since dicamba comes with its notorious drifting problems, seed/chemical companies are introducing GE crops that are simultaneously tolerant of five different herbicides (Elmore, 2022). The chemical companies' incentive in their GE seed development is, naturally, to sell more chemicals.

This chemical dependency has been criticized by many in recent literature and is a frustration to farmers as well as tree huggers (Elmore, 2022). Many experts advocate for a return to old-fashioned and diversified methods of weed control, such as cover crops, more complex crop rotations, and regenerative agriculture.

A return to complex rotations and cover crops is about as likely to happen as a return to the 55-mph speed limit. Farmers I know have gotten used to beautiful, spotless, weed-free soybean and corn fields (fig. 3). They have left behind the diverse crops they used to plant in rotations. Most now exclusively plant and depend on seeds that have been genetically modified to resist over-the-top herbicides. In order to stay competitive, with the narrow profit margins farmers have these days, my neighbors are not likely to give up any of the tools that give them the edge over weeds.

SECONDARY DRIFT IS AN UNPREDICTABLE PROBLEM AROUND TREES

This increasing problem of herbicide drift damage has prompted a lot of academic research in agricultural universities. Bish *et al.* (2020) explains what we now know about drift. Primary drift is transport of the active ingredient through air flow at the time and place of application. That part can be controlled by the applicator. Nozzle type, droplet size, boom height, and sprayer speed are under the applicator's control.

Secondary drift occurs after the application and is more difficult to control. Vapor drift and wind erosion depend on chemistry and weather factors hours and even days after application. Topography, ground cover, ambient winds, radiative heating, temperature inversions, air turbulence, cool air drainage, heat and humidity in the hours and days following application are among the many factors that make secondary drift unpredictable. Pesticides that are in the atmosphere, whether vapor, suspended droplets, or on dust, can rain down or settle on crops and trees at a distance from the field sprayed.

In one illustrative study, smoke bombs were set off in a field in Missouri to

***Figure 3.**—Foliage on chestnut two weeks after herbicide burn down for soybean site preparation showing evidence of herbicide drift into shelterbelt.*

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***Figure 4.**—Foliage showing leaf cupping and curling on chestnut at least 100 feet upwind of field sprayed two weeks earlier.*

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observe how the smoke plume moves under different weather conditions. According to Bish (2020), "In the same field where a smoke bomb was released to illustrate cool air drainage, and a few meters into the nearest tree line, sporadic damage that resembled dicamba and glyphosate injury was observable at heights similar to those reached by the smoke plume. One possible explanation for the observed injury is that the pesticides moved into the air following application and in a similar fashion to the initial vertical rising of the smoke bomb. Another possibility is that the pesticides may have volatilized into the air. Regardless of how the pesticide moved into the air, horizontal winds likely moved the chemicals into the tree line where the leaf surfaces could have served as an obstruction to the horizontal air movement, allowing dry deposition of the chemical."

Bish adds photographs showing herbicide injury high up in the trees near a farm field, very like the injury I found on the edge of my protective shelter belt (fig. 4). He observed glyphosate-type damage as well as auxin-type damage high up in the trees, demonstrating that even glyphosate can lift and drift when in tank-mix combinations.

In my particular case, a mystery persisted. The wind reported by the farmer was away from my trees at the time of application, yet the damage was visible in the upwind direction. There are at least two possible answers: time and turbulence. The first is a change of conditions within the active time of the chemical, combined with the extreme sensitivity of the trees at that season. According to Stepanek (2018), "These herbicides [2,4-D and dicamba] can be particularly damaging to tender foliage emerging in spring, especially on sensitive trees…Many of the formulations of dicamba and 2,4-D are quite volatile. This means the herbicides can form a gaseous vapor during or following application— sometimes even days later. Warmer temperatures (typically above 85 degrees) increase volatility, and may result in the vapor moving long distances from the application site on warm spring and summer days."

In May, when soybean burndown applications are typically made in my area, tree leaves are new, tender and susceptible and the weather is unpredictable.

There is an official weather station within one mile of our orchard. On 12 May 2022, 5:52 am, at the time of spraying the temperature was indeed 69°F, and winds light, as reported by the farmer. But the sun rose and by 11:52 am the temperature exceeded 85°F and stayed above that mark until 8:52 pm, with the high being 94°F. In addition, the winds reached 21 mph, gusting to 36 mph through the day after spraying. High wind and high temperature had been predicted. Overnight the wind changed and blew toward my orchard, followed by thunderstorms and light showers. The second day the temperatures rose again above 85°F for most of the day; winds remained calm. At some subsequent day, my neighbor came back and drilled his soybean seeds into the ground no-till, undoubtedly kicking up dust and vegetative debris, to which the residually potent herbicide adhered.

THE MIXED CONSEQUENCES OF TREES, SHELTER BELTS AND WINDBREAKS

The most common advice to spray applicators from extension officers is: "Make sure the wind speed is low and blowing away from sensitive areas" (Ogg *et al.*, 2018). This is good advice but not good enough. It should also advise: "Stay well away from upwind trees."

An orchard of trees, especially large species like chestnuts and pecans, is a windbreak. Studies of windbreaks have long recognized that turbulence occurs on the leeward side of a tree line if not sufficiently permeable (Caborn, 1957). Open windbreaks (orchards) slow the wind and allow it to move horizontally over adjacent crops or trees. As wind passes over the top of a dense windbreak eddies form mixing dust and volatile pollutants. Application of an herbicide downwind of a dense tree line can be pulled by turbulence up and in a direction opposite to the general horizontal wind direction (Tengnas, 1994; fig. 5).

It is today's wisdom, which I endorse, that a farmer of herbicide sensitive crops, including tree crops, should plant a windbreak or shelterbelt to physically intercept a neighbor's herbicide drift on all sides (Warmund, 2022). In my case, although the herbicide penetrated inside my shelterbelt, damage was worse where the shelterbelt was a single row of trees and less apparent where my shelterbelt was a few tree rows wide. The damage could have been much worse without the buffer of sacrificial trees.

The irony is that the specialty crop farmer, whose crop is worth perhaps thousands of dollars per acre, must spend his acreage to wall off or buffer the trespass of his neighbor who, if growing corn and soybeans, produces perhaps merely hundreds of dollars per acre. But this is a fact of life because commodity farming is bigger and more important to the

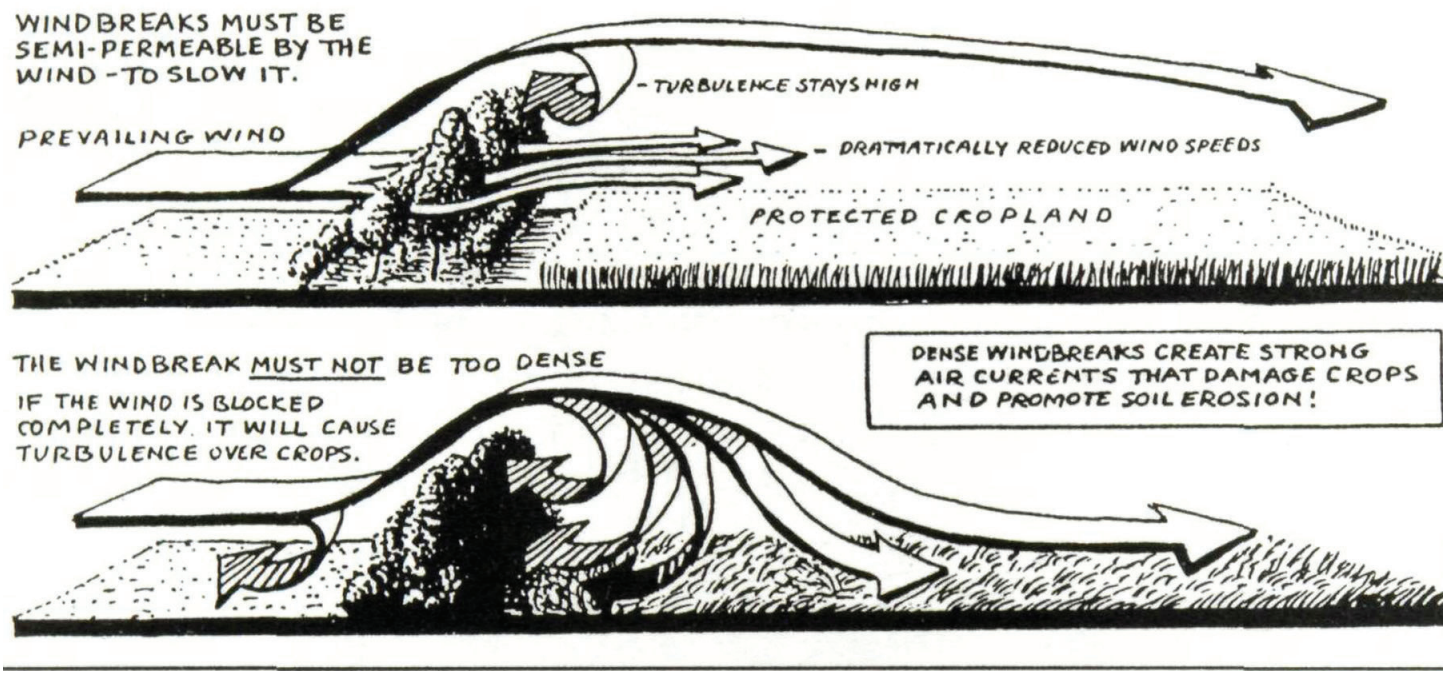

***Figure 5.**—Dense windbreaks create turbulence downwind and backwash eddies [Credit: Tengnas 1994].*

economies of most mid-western farm states than specialty crop and nut tree farmers.

Although the bulk of literature on shelterbelt design aims for protection of downwind crop land by slowing winds, there is some useful recent literature considering pollution reduction which may apply to herbicide drift as well. I discovered studies confirming that coniferous trees can best absorb or block atmospheric particulates, but some deciduous trees with leaf hairs or textures are also good (Chen *et al.*, 2017). Another study compares the herbicide resistance and recovery among different fruit, nut and ornamental species exposed to 2, 4-D and dicamba (Dintelmann *et a*l., 2020).

When designing a new shelterbelt to physically intercept herbicide drift, select tree and bush species suitable for your soil and climate. The shelterbelt trees must have foliage at the time of year of likely herbicide drift. The trees and bushes should be species that research and experience show can shrug off herbicides and recover.

IS REPORTING HERBICIDE DRIFT A CIVIC RESPONSIBILITY?

The trouble with the label-is-the-law is that the label is written by the herbicide manufacturer in consultation with, and sometimes litigation against, the EPA. It is a battle of competing interests.

According to the Nebraska Pesticide Program, "Recently, the EPA indicated that while some pesticides can cause adverse visual effects in non-target organisms, the agency must weigh the benefits of the pesticide against the risk of harm it could cause, in order to determine whether the adverse effects are considered unreasonable."

In the balancing act, the determination of what is unreasonable by the EPA must be informed by facts. One of the facts is how severe and widespread is the damage. The pesticide manufacturers have the first and loudest voice at the table, a profit incentive, and perhaps the moral argument that herbicides are necessary to promote agriculture. Unfortunately, the system discourages people damaged, like me, from making a report.

As explained by Pistora (2018), "However, while the-label-is-the-law proviso may legally provide victims of pesticide drift some protection, proving technical data of wind speeds and specific pesticide-caused drift damage from a certain neighbor can be socially and legally difficult, time-consuming, and burdensome, deterring many non-commercial growers from seeking reconciliation."

Over a year has passed since my face-to-face conversation with the neighboring farmer. The tree leaves that were curled and twisted in spring 2022 stayed curled and twisted all season long until they fell in October. I noticed some slight herbicide damage on my opposite boundary later in the season, and again asked for, and received, a chemical spray report from the farmer. There were brand name chemical products I have not had time to run down. The damage symptoms that second time showed up mainly in the shelterbelt.

My chestnut crop in 2022 turned out to be 40% less than the preceding year. But nut tree harvest volume is volatile year after year. This spring there is considerable twig damage in the tops of the trees, which could be just cold damage. Most of the trees have leafed out in 2023; only a couple of trees are dying, and from what I do not know. I have followed the course of wait-and-see, but I cannot measure with certainty the damage from herbicides, as distinctive from the other challenges of climate and disease. That may be why the vast majority of herbicide damage to people like me goes unreported.

According to the EPA (2022), "A survey of mid-western specialty crop growers found that 45 percent of participants had crops impacted by some level of herbicide drift in 2020. However, the survey indicated that only 6 percent of growers reported incidents when herbicide damage was detected in 2019 and 2020."

Continued on next page...

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EPA is effectively making the law of herbicide use. It registers pesticides with reference to labels which prescribe when and how the chemical may be applied and by whom. EPA is holding a scale to determine if the benefits of an agricultural pesticide outweigh the risks. How are the risks to be weighed or minimized if those being actually harmed do not report?

Had I filed a report of my herbicide damage with the Kansas Department of Agriculture, the incident would at the very least have been counted with the statistics of incidents that the EPA must take into account. I remain troubled that I did not.

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ABOUT THE AUTHOR

Charles K. NovoGradac and Debbie Milks have planted and managed since 1995 a 20-acre certified organic farm in Lawrence, Kansas with roughly 1500 nut trees including chestnut, walnuts, and pecans. They do business as Chestnut Charlie's Organic Tree Crops through on-farm and internet sales.

Continued from page 5...

Spiced Chestnut and Sweet Potato Soup

Delight in the warmth and spice of the season with Spiced Chestnut and Sweet Potato Soup. This gluten-free and vegan masterpiece marries chestnuts and sweet potatoes, delivering a nutrient-rich and aromatic experience.

- 2 cups chestnuts (canned or roasted)
- 3 cups sweet potatoes, diced
- 1 apple, peeled and chopped
- 1 onion, finely diced
- 4 cups vegetable broth
- 1 tsp ground cinnamon
- 1/2 tsp ground nutmeg
- 2 tbsp olive oil
- Salt and pepper to taste

1. Heat olive oil in a large pot. Sauté the onions until soft and translucent.
2. Add sweet potatoes, apple, and chestnuts. Cook for a few minutes.
3. Stir in the vegetable broth, cinnamon, and nutmeg. Bring to a boil, then simmer for 20 minutes.
4. Blend the soup until smooth using an immersion blender.
5. Season with salt and pepper, and serve with a sprinkle of cinnamon.

Chestnut Growers of America Flyers Available Upon Request

CGA has developed a flyer for our organization that nursery owners can hand out to customers or include with orders. All members are welcome and encouraged to use the flyer as well.

The flyer can be downloaded and printed from the members-only page of the CGA website. CGA will also print flyers and ship them to you at no cost.

To request flyers, email the editor at chestnutgrowersofamerica@gmail.com and include the number of flyers you are requesting and confirm your mailing address.

Give your marketing a boost with a paid CGA Grower Directory listing

The online Grower Directory (www.chestnutgrowers.org/growers.html) provides a way for potential customers to look up chestnut growers in their area. An option to post a paid listing helps your orchard stand out with a photo and more detailed information. From the listing, customers can link directly to your website or contact you via email. Your renewal form includes the option for you to select a paid listing (still $25.00/year) or a free listing. CGA regularly directs outside inquiries about local chestnuts to the online directory, so this is a marketing opportunity you can't afford to miss!

Renew Your CGA Membership for 2024

Please complete the form on the following page to renew your CGA membership for 2024. Alternatively, you can download a fillable PDF from the CGA website (or attached to email newsletter mailing) and pay your dues online via PayPal (see instructions at top of form).

Remember, a $10 late fee is implemented for members renewing after April 1. If you do not renew and pay dues by the conclusion of the annual meeting in the summer, you will be removed from the newsletter mailing list, the email list, the website grower directory, and the members-only website access. You will receive a series of reminders to renew prior to these deadlines. If you plan to renew, please do so promptly. Thank you!

Membership Application/Renewal Form

Chestnut Growers of America, Inc.

Please complete application and **EITHER** mail to:

Chestnut Growers of America, Inc., Attn: Jack Kirk, 2300 Bryan Park Avenue, Richmond, VA 23228

OR email (scanned copy or fillable PDF, available for download at www.chestnutgrowers.org/resources.html) to: jackschestnuts@gmail.com.

Instruction for completing PDF application: Download fillable PDF and save it to your computer. Open the PDF with Adobe Acrobat or Reader (not a web browser). Fill out the form by clicking in the purple text bars. Go to File > Save As, and then save the PDF with your name (for example, "CGA 2020 Membership Application - Smith). Before emailing your application, close Adobe Reader, and then re-open your application and make sure the information you filled in still appears in the document. Then attach your application to your email to Jack.

For dues payment, **EITHER** mail check to Jack Kirk at Richmond address; **OR** submit your dues online via PayPal at www.chestnutgrowers.org/paydues.html. ***Please ensure that you have submitted both your application and dues.***

A Farm/Business/Organization Name:

B

First Name	Last Name	First Name	Last Name
(Individual/First Household Member)		*(Second Household Member)*	

_____**New Member Application** *(please complete sections C-K below)*

_____**Renewal** *(please complete sections I-K below)*

_____No updates to lines C-H below. Please use info from last year.

_____My information has changed. I have provided updates below.

C Address

D

City	State/Province	Zip/Postal Code	Country

E

Phone	Fax
( )	( )

F

Email	Website

G

Acreage in Chestnuts	# of Trees	Year First Planted	Previous Year's Production (lbs)

H Cultivars Grown

I Please send newsletters in the following format (*$5.00/year for print to cover cost of printing and postage):*

_____Email Only _____Print Only _____Both Email and Print

J Listing on the CGA website grower directory (chestnutgrowers.org/growers; *see reverse for more info*):

_____Free Listing _____Paid Listing _____Please do not list my information on the website.

Continued on reverse ➔

_____**New Member** or **Renewal** ***before*** **April 1**

K	Membership Dues	
	_____Household Membership	$55.00
	_____Individual Membership	$45.00
	_____Associate Membership	$60.00
	_____Print Format Newsletters (see **I** above)	$5.00
	_____Paid Listing on CGA Website (see **J** above)	$25.00
	Total dues for this year:	_____

Renew Today!

A $10 late fee is applied after April 1; after that date dues increase to $65 for a household membership and $55 for an individual membership.

_____**Renewal** ***after*** **April 1**

K	Membership Dues	
	_____Household Membership	$65.00
	_____Individual Membership	$55.00
	_____Associate Membership	$70.00
	_____Print Format Newsletters (see **I** above)	$5.00
	_____Paid Listing on CGA Website (see **J** above)	$25.00
	Total dues for this year:	_____

Today's Date:

_____

Listings on chestnutgrowers.org Grower Directory

Paid listings include a photo of you taken in your orchard/farm, your orchard name, address, phone number, email, website link, and a description of your orchard. This is a great way to make your information stand out to potential customers! Free listings include the orchard name, address, and phone number.

If purchasing a paid listing, send a high-quality photo and your written description (150-200 words) to the webmaster at chestnutgrowersofamerica@gmail.com.

Paid Listing Example

Allen Creek Farm

PO Box 841, Ridgefield, WA 98642
(Website) (Email) Phone: 360-887-3669

Planted in 1999, Allen C
customers throughout
flour and a delicious pa
are inspected annually
certificate that allows tl
WSDA is done of the co

The Youngs practice su
population and a foliar
nutrient needs of the tr
and is not a potential s

Nuts are refrigerated within 24 hours of harvest at 33° I

Curious about just how things are done? Visit our websi
trees to you. (2016)

Free Listing Examples

Chestnut Ridge of Pike County
18483 US Hwy 54
Rockport, IL 62370
217-437-4281

Thistle Creek Orchard
35 Shady Ln.
Avon, IL 61415
309-678-7216

Green Glades Chestnuts
10396 E. 1000th St.
Macomb, IL 61455
309-255-6189

Twinsholler Chestnut Orchards
1514 190th Ave.
Cameron, IL 61423
309-221-2955

Atlas Nuts
18521 US Hwy 54, Rockport, IL 62370
516-641-4513

Chestnut Growers of America End-of year Financial Report, 2021-2023

Membership and financial summaries prepared by Jack Kirk, CGA Treasurer / Secretary

		2021	2022	2023
Income	Annual Meeting Registrations	--	2,262.67	3,023.50
	Annual Meeting Silent Auction	--	439.45	63.50
	Membership Dues	5,940.44	6,589.69	6,981.18
	Online Grower Directory	300.00	220.00	225.00
	Interest Income	34.24	1,017.64	362.18
	Newsletter Advertising	275.00	430.00	325.00
Total Income		**6.549.68**	**10,959.45**	**10,980.36**
Expenses	Annual Meeting	--	(630.27)	(550.00)
	Insurance	(1,122.00)	(1,122.00)	(1,122.00)
	Newsletter	(856.23)	(540.33)	(794.56)
	Communications Director	(2,468.75)	(1,887.50)	(993.75)
	Organizational Expenses	(50.00)	(50.00)	(50.00)
	Website	(227.95)	(291.92)	(177.91)
Total Expenses		**(4,724.93)**	**(4,522.02)**	**(3,688.22)**
Net Income		***1,824.75***	***6,437.32***	***7,292.14***
Cash, beginning of year		***24,052.39***	***25,877.14***	***32,314.57***
Cash, end of year		***25,877.14***	***32,314.57***	***39,606.71***

Membership Report, 2021-2023

Members	**2021**	**2022**	**2023**
Household	63	64	68
Individual	52	75	82
Associate	1	0	1
Honorary	0	0	0
Complimentary	1	1	1
Total	**117**	**140**	**152**

CGA Board of Directors Sectretary/ Treasurer Position Open Next Year

If you are interested in serving as the next CGA Treasurer/ Secretary, or to nominate someone, contact CGA President Roger Blackwell at rblackwel@comcast.net or 810-923-2954.

For Sale / Seeking

80-Acre Piece of Land with Chesnut Farm in Moscow, IA

Wears Auctioneering in Solon, IA is auctioning off an 80 acre piece of land with a chestnut farm in Moscow, IA. Reach out to Lynn Pinneke (wearsofficecoordinator@gmail.com) with questions. Details here: www.wearsauctioneering.com/auction/80-acre-oasis-in-cedar-county---live-public-real-estate-auction-69072/details.

Looking for Information on Bulk Chestnut Peelers

Looking for info on, recommendations for, and product descriptions of bulk chestnut peelers. Have looked online, but not a lot of info, especially the ones made in China (which we really don't want to buy). By bulk, I am looking at 25 to 200 pounds at this time. Any advice or help appreciated. Contact John & Jennifer Shank of Chestnut Acres Farm at jenohn@charter.net.

Seeking Torakuri, Kaibutsu, and Jenny Scion Wood

I am searching for Torakuri, Kaibutsu, and Jenny scion wood. If you can help, please contact Davor Juretic at juretic.davor@gmail.com.

Chestnut Growers of America
2300 Bryan Park Ave.
Richmond, VA 23228

The Chestnut Grower

Fall 2023 / Winter 2024

Chinese Chestnuts Proudly Grown by Family Farmers in America's Heartland!

Prairie Grove Chestnut Growers is an association of over 60 chestnut growers from Iowa, Illinois, and Missouri!

Harvest

Our Chinese Chestnuts are harvested and brought in fresh by our growers

Cleaned + Sorted

Next, our chestnuts are cleaned, sorted by size, bagged, and refrigerated to maintain peak freshness and flavor.

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Delivered for Your Enjoyment

Lastly, our chestnuts are delivered to you and over 1,800 other happy customers across 46 states and counting. No matter how you enjoy them, our chestnuts are guaranteed to satisfy!