



Promoting Chestnuts and  
Connecting Chestnut Growers

# THE CHESTNUT GROWER

Vol. 21 No. 2 · April 2019

A Quarterly Newsletter published by Chestnut Growers of America, Inc. · [chestnutgrowers.org](http://chestnutgrowers.org)



## Using the Natural Process to Change Your Thinking about Fertilizer

What can earthworms, exudates, and a little knowledge about soil biology do for you?

By Dave Royal, Earthworm Soil Factory, Chico, CA | [dave@earthwormsoilfactory.com](mailto:dave@earthwormsoilfactory.com)

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The Earth contains all the nutrients necessary to grow healthy plants for human and animal consumption. In many areas, decades of over-production fed by chemical fertilizers have depleted the soil of microbiological catalysts necessary to allow plants to access these nutrients.

I believe that we have lost faith in the soil. Our first instinct is to add something to the soil to get results from the plant. But nobody fertilizes the forest. In fact, if you would like to destroy the forest, fertilizing it would be a good way to do it.

If you really stop to look at how nature works, you realize that not only does it sustain itself, it also inspires an eco-system of support. The biggest reason people feel like they have to add fertilizer to sustain their plants is due to the incorrect notion that plants deplete the soil. Plants don't deplete the soil. Again, look at the forest.

When there is a healthy relationship between the two, plants do the opposite of deplete the soil. If the forest can sustain itself, why can't your plants?

I founded a company called **Science of Nature** in 2008 as a tool to educate people on the importance of the natural process and healthy soil-plant relationships. I'm dedicated to helping us change the way we think about fertilizer. I'm inspired by nature's incredible ability to sustain life, and I've worked to pinpoint the essential steps necessary to inspire a self-sustaining growing process.

Through Science of Nature, I offer classes about how the natural process works and how to use it as part of a growing system. We get down into the inner workings of the microbiology that makes a healthy connection between soil and plants

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# THE CHESTNUT GROWER

April 2019

## 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](http://chestnutgrowers.org) for more information.

## Board of Directors

President	Roger Blackwell	(810) 923-2954 rblackwel@comcast.net
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## Committees

Editor/Webmaster	Rita Belair	chestnutgrowersofamerica@gmail.com
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## Annual Membership Dues

Single membership, \$35; Household membership, \$45; Associate membership, \$50. Members receive *The Chestnut Grower* quarterly. Emailed newsletters are included. Mailed newsletters are an additional \$5 per year. A \$5 discount applies if payment is postmarked or submitted through the website by Feb. 15. Foreign mailings may include a surcharge to cover the cost of additional postage.

## Advertising Rates

Full page, camera ready	\$20.00
Half page, camera ready	\$15.00
Quarter page	\$10.00
Business card (4 issues)	\$15.00
Classifieds	FREE

Email ads to [chestnutgrowersofamerica@gmail.com](mailto: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](http://www.chestnutgrowers.org/paydues.html) to submit payment online via PayPal.

## Deadlines

Issue	Deadline	Mailed
Winter	Dec. 10	Jan. 1
Spring	Mar. 10	April 1
Summer	June 10	July 1
Fall	Sept. 10	Oct. 1

## Editorial Opinion

The views, articles and advertising appearing in *The Chestnut Grower* do not necessarily reflect the attitude nor policy of Chestnut Growers of America, Inc., its members, officers, Board of Directors, or Editor. Chestnut Growers of America, Inc., and this publication are not responsible for errors and/or misrepresentations in advertising. The Editor reserves the right to reject or edit all material submitted for publication.

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## Message from CGA President Roger Blackwell, Chestnut Grower



Happy vernal equinox! I know it is April already, and Spring has sprung. This year, CGA's Annual Meeting will be held in Hickory Corners, Michigan on Friday June 7th through Sunday June 9th, 2019. The meeting will be in one location at the MSU Kellogg Biological Station. The MSU site is where we will stay with room and

board provided. All our meetings for the weekend will be in one place, and no driving will be needed until you leave on Sunday. A complete program agenda and other logistical information is provided in this newsletter. Please mark your calendar and plan to attend this very educational meeting. Please register by May 7, 2019 to take advantage of the early bird discount and so we can have good count of how many members will be attending this great meeting. The last day to register is May 31, 2019.

Here is a brief overview of the planned meeting for the three days. On Friday June 7th we will be having registration and get your room assignments. We will have a social time to meet and greet with refreshments and snacks and a cash bar available for everyone. On Saturday June 8th many topics will be covered. The Annual Chestnut Marketing Survey results will be presented by Dr. Michael Gold. Dr. Jeanne Romero-Severson will bring us up to date on the DNA Markers project. Dr. Monique Sakalidi, MSU Department of Plant, Soil, and Microbial Sciences, will present the latest in chestnut diseases. Dr. Dan Guyer, MSU Biosystems and Ag Engineering, will discuss postharvest heat treatment of chestnuts. Please see the meeting agenda for the complete schedule of chestnut topics to be presented.

On Sunday morning our CGA Board Meeting is scheduled from 8:30am to 10:00am. All members are welcome to attend. Our Slate of Officers is now complete for the 2019/2020 year and is presented in this newsletter. Two field trips are scheduled to visit on leaving the MSU Kellogg Biological Station. Each location will be available to visit from 11:00am to 1:30pm. The Chestnut Growers, Inc. chestnut receiving operation located in Clarksville, Michigan will be open to have a tour, and Roger Beyer's Chestnut Orchard in Paw Paw, Michigan will be open for tours. We will have maps and information at our meeting to visit these two locations.

Finally, as you read this enclosed issue, please consider inviting other non-member chestnut grower friends you might know to attend the Annual Meeting in Michigan. See you there!

Best Regards,

Roger



The Chestnut Grower

# Updates from the University of Missouri Horticulture and Agroforestry Research Center

By Dr. Mike Gold, University of Missouri Center for Agroforestry | goldm@missouri.edu

Chestnut cultivar trials have been ongoing at the University of Missouri Horticulture and Agroforestry Research Center (HARC) since 1998. HARC is the primary research site for the University of Missouri Center for Agroforestry. Based on our findings, we maintain a list of recommended cultivars for chestnut growers, which currently includes Qing, Peach, Kohr, Sleeping Giant, Gideon, and Mossbarger. Of course, our findings are limited to our experience with the cultivars' performance here in mid-Missouri. Some of the cultivars that have not been as successful might do well elsewhere, and some that do really well here may not do as well in very different environments.

A shortage of labor in the past several years has made it difficult to collect good data on the few dozen cultivars we have planted. Although we have many cultivars,

most of them exist as only one or two trees. When our collections were young and producing under 10 lbs per tree (up to around 2010 and earlier), we had Dr. Ken Hunt working for the Center, who was full-time focused on getting the data from all the trees. Since Ken left in 2011 and production went sky-high, we have unfortunately been unable to collect data on the vast majority of the cultivars.

We have looked at a large number of cultivars beyond the few we actually recommend. We do not recommend dozens of cultivars due to a combination of factors, primarily:

- Low or inconsistent yield year to year
- Small or hugely variable nut size
- Nuts falling to the ground in the bur (which makes harvest a real hassle)
- The tendency to split open when ripening (can't sell those)

The cultivars that tend to drop nuts first then burs later are the best for pickup. Bigger nuts are also much easier to pick up.

We have looked at (and not found to be top producers in terms of yield and/or nut size), for example:

- Payne
- Perry
- Hong Kong
- Amy
- NC-8
- OK-Kwang
- Willamette
- Ford's Tall
- Ford's Sweet
- Shing
- Orrin (one of my colleagues thinks Orrin has excellent-tasting chestnuts, but we do not have recent data on nut size or yield)

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## Mark Your Calendars!

**For the Chestnut Growers of America  
2019 Annual Meeting in Hickory  
Corners, Michigan, hosted by Roger  
Blackwell and Bill Nash**

**June 7 - 9, 2019**

### SHARE:

Catch up with fellow growers at social events, share tips and resources, and enjoy great food.

### LEARN:

Hear presentations from industry experts and tour processing facilities, orchards, and more.

### PARTICIPATE:

Vote on CGA business and share your ideas to grow our organization.

*Find complete program and registration information on page 11.*

## Renew Your CGA Membership

*Your 2019 membership dues are now past due. (If you are a new member who joined after August 1, 2018, your dues are already paid for 2019.) For members who have not yet renewed, you have two options:*

### **Renew Online**

Download a fillable form from the CGA website at [www.chestnutgrowers.org/2019\\_CGA\\_Membership\\_Application\\_fillable.pdf](http://www.chestnutgrowers.org/2019_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](mailto:jackschestnuts@gmail.com). You can then pay your dues through the CGA website by visiting [www.chestnutgrowers.org/paydues.html](http://www.chestnutgrowers.org/paydues.html). Please make sure you submit both your application and payment at the same time! ~OR~

### **Renew by Mail**

Please fill out, detach, and return the membership renewal form included with the January 2019 issue on page 10. Send the form with a check made payable to Chestnut Growers of America, Inc. to Jack Kirk, 2300 Bryan Park Ave., Richmond, VA 23228.



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possible. The methods we teach let people use the incredible growing capabilities that have worked in nature for many thousands of years. I've worked alongside walnut growers, helping them to completely eliminate fertilizer from their growing process and see their heaviest crops ever.

Knowing what is happening in your soil can catapult your growing process and help you fortify everything you grow. Basically, I want people to trust their plants. They know what they are doing.

Now, I believe that we shouldn't criticize Monsanto or anyone else in the industry for their practices unless we can offer a solution, otherwise we're just pointing fingers. It would be really nice to just say, hey, maybe you shouldn't fertilize. But then what would people do? That's what I'd like to do here – provide you with the understanding and some of the methods you might need to change your thinking about fertilizer.

### Soil Biology

It all starts with soil biology. **Microbes** are tiny organisms that live in the soil. We greatly underestimate all that soil microbes can do. There are two types: aerobic and anaerobic. Aerobic means “with oxygen”, and these microbes are the highly beneficial good guys of the soil. They feed the plants, balance the soil through nutrient values, break down organic materials into exchangeable nutrients, and provide nutrients when the plant needs them. Each type of microbe has a different job to do, corresponding to all the different things a plant needs throughout the year. So microbe diversity is just as important in the soil as microbe abundance. Microbes can also be anaerobic, which is what happens when things become hardened and compact. Then you might get standing water and start noticing an odor that's associated with anaerobic conditions. Most microbes are “facultative”, meaning they can be either aerobic or anaerobic, depending on the soil conditions. For example, you might have a good aerobic compost pile, but if you stop turning it, it's going to get hot and start to stink, telling you it's gone anaerobic. In the wrong situation, microbes can turn on you quickly. Instead of being beneficial, they can become detrimental to plant and soil structures. They will start robbing the plant of nutrients and giving them off in

“Knowing what is happening in your soil can catapult your growing process and help you fortify everything you grow. Basically, I want people to trust their plants. They know what they are doing.”

a gaseous form, which is what creates the odor when those start leaving the soil. Maintaining good aerobic conditions is very important.

It's also important to remember that in the soil, balance is key to keeping aerobic conditions going. Microbes both feed the plant and balance the soil so that the plant can sustain itself. You probably want the microbes to mainly be able to feed the plant, but they can't do that if they are constantly having to keep the soil in balance. When we keep adding things to the soil, even things that seem like they would be very wholesome, we keep creating an imbalance. We keep taking the microbes away from their first-priority job, which is to take care of the plant.

### Soil-Plant Relationships

How do the plant and the soil interact? The main thing to keep in mind here is the **exudate** system. Every living organism on the planet has a waste stream, and the waste stream of a plant is the exudate system. Exudates are simple proteins, sugars, and carbohydrates. They are the slime you would feel on the roots of a plant if you pulled it out of the ground, and it is the communication network for the plant to the soil. A plant sends out specific exudates every day at specific times through its root system. By doing that, it is attracting a specific microbe in the soil to do a specific job for the plant. The plant has the ability to tell the soil what it needs, when it needs it, and the microbes, the chefs of the soil, are able to feed it. This is called the natural process, and when it's working, we have healthy soil, healthy plants, and healthy people.

When we add traditional fertilizers to the soil, we interfere with this natural symbiotic relationship. Constant inputs to the soil take away the plant's ability to grow and sustain itself in relationship with the soil. If the natural process is not working, the plant will send out an exudate calling for the nutrients it needs, but the microbe it needs to feed it might be off doing another job, or it may have just been killed off by synthetic fertilization. Once the

plant figures out what's going on, that it's not going to be healthy, that it's probably not going to make it, it will send off its exudates through the leaf system, telling insects to come and eliminate it, hoping that the next generation will succeed instead. In a manner of speaking, the plant isn't healthy, it knows it, and it's going to do something about it, which isn't good.

To allow the natural biological process to sustain itself, we need good organic material, numerous and diverse microorganisms, and a change in our thinking about constant inputs.

### The Power of Earthworms

At the Earthworm Soil Factory, we employ one of the planet's most amazing animals, the earthworm, to produce a wide range of products that make soil healthier. For our large-scale operation, we divert large amounts of green waste from landfills, which is then ground and composted. The compost is then used as feedstock for our earthworm workforce. Our worms feed on the nutrient-rich green waste compost, producing **vermicompost** or worm castings. Worm castings are the end product of the breakdown of the compost by earthworms. When the earthworms eat, they push the castings down, and they push anything they can't eat to the top, which becomes a mulch layer. With enough worms, the rate at which they eat can be really prolific. In fact, you can see very noticeable differences in the buildup of the mulch layer after just four hours. The vermicompost, which is pulled off the



*An earthworm and worm castings. Photo courtesy of the Earthworm Soil Factory.*



Dave Royal explains the science of the natural process during a tour of the Earthworm Soil Factory at the Chestnut Growers of America annual meeting in June 2018. Photo by Rita Belair.

bottom, can then be mixed directly into the soil.

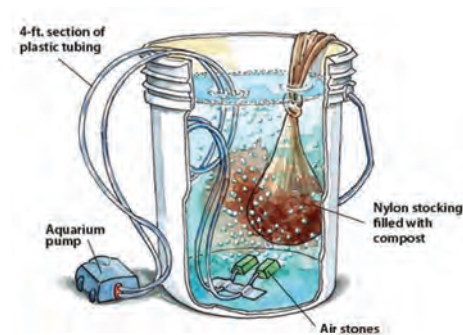
Vermicompost is quite possibly the world's richest and most diverse source of helpful microorganisms. When added to even the worst, most depleted soil, it enables plants to access nutrients locked within the earth. Using this method, the soil amendments produced from this process act not just as fertilizers, but also revitalizers and catalysts for healthy, vitamin-rich plant growth.

When thinking about alternatives to traditional fertilizer, you might think of manure or spent mushroom compost. But those have their drawbacks. When the organic industry really took off about 15 years ago, it seemed like everybody started trying these methods. Cow or chicken manure is a good start, but it is much lower than vermicompost in beneficial microorganisms. Also, manure can have high levels of *E. coli* and other pathogens, and spent mushroom compost is often inundated with fungus gnats. But with vermicompost, the worms have actually purified the soil and eliminated most pathogens. Worms create a compost that is both abundant and highly diverse in microorganisms and pathogen-free.

### Compost Tea

Compost teas are extracts leached from composted materials that can also be applied to improve soil and plant health. Compost tea is made by "brewing" worm castings to grow microbes. In our facility,

we brew 4-10 pounds of worm castings in a 1000-gallon tank, which creates huge microbe populations. One gallon of compost tea can have the equivalent effect of 1000 pounds of worm castings. This is because one microbe in a properly prepared compost tea can become 100 million million microbes in just 24 hours. We can then apply that brew to the leaf or the soil to jump-start the natural biological process. There are many different types of recipes and brewing systems, but what you want to see in compost tea is a high number of diverse types of microorganisms. Remember that high numbers don't mean anything if you don't have high diversity.



An example of a compost tea home-brewing system. Illustration courtesy of the Earthworm Soil Factory.

Compost tea can also benefit a plant when it's in defense mode. Most of the time, when everything is in balance, the microbe soldiers in the soil can defend a plant better than anything. But if a plant

is weak enough that it sends exudates out through its leaf system, we can foliar-spray compost tea and cover that plant with beneficial microorganisms. They will clean the exudates off and make the plant look healthy again. They want the plant to make it, because it's their new home.

### Some Practical Suggestions

After all that, you might be wondering what exactly you can do, as a practical matter, if you know you need to do something to improve the health of your soil, but you don't want to use traditional fertilizers. Well, first do a soil test so you can understand where you're at and get an idea of where you want to go. Then get a good aerobic compost and maybe compost teas, apply those, and start building organic material. Remember that not all organic compost is created equal. You need to make sure that what you're getting is in fact aerobic. Anaerobic compost has nothing left in it – it's like a dead battery. Let your nose be your guide for this. The facility should be clean and good-smelling. Once you've got the natural process going in the soil, then look at a leaf analysis to make sure you also have a healthy tree.

The difference in using the natural process that we use at the Earthworm Soil Factory is that once we get our customers going, we don't see them anymore. Traditional soil amendment programs will keep you coming back year after year, forever, all in the name of health. If our customers have committed 100% to following our protocol, we've been able to let them see huge results in as little as 16 months. Within three years, most of them have transitioned away from our program. You might think, it doesn't matter what I do, as long as I'm seeing growth. But growth is not health, not even close. This is why I think we need to change our thinking about fertilizers and start working with the natural process instead. 🍎

To learn more about Dave Royal and the Earthworm Soil Factory, visit [www.earthwormsoilfactory.com](http://www.earthwormsoilfactory.com) and [www.scienceofnature.info](http://www.scienceofnature.info).

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# Updated 2019 Michigan Chestnut Management Guide Now Available

By Erin Lizotte, Michigan State University Extension | [taylo548@msu.edu](mailto:taylo548@msu.edu)

The new “Michigan Chestnut Management Guide”, available for chestnut growers through Michigan State University Extension, has information helpful for many growers from the Midwest and beyond.

IN AN EFFORT to assist chestnut growers in making pesticide and nutrient management decisions, an updated “Michigan Chestnut Management Guide, 2019” is available at the Michigan State University Extension Chestnuts page ([www.canr.msu.edu/chestnuts](http://www.canr.msu.edu/chestnuts)). The packet includes a listing of registered pesticides, nutrient management recommendations and a guide to seasonal pest occurrence in Michigan.

To protect yourself, others and the environment, always read the label before

applying any pesticide. Although efforts have been made to check the accuracy of information presented in the “Michigan Chestnut Management Guide,” it is the responsibility of the person using this information to verify it is correct by reading the corresponding pesticide label in its entirety before using the product.

Reference to commercial products or trade names does not imply endorsement by MSU Extension or bias against those not mentioned. Information presented here does not supersede the label directions.

This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under Agreement No. 2017-700006-27175. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

Download the guide: [www.canr.msu.edu/chestnuts/pest\\_management/Michigan\\_Chestnut\\_Management\\_Guide\\_2019.pdf](http://www.canr.msu.edu/chestnuts/pest_management/Michigan_Chestnut_Management_Guide_2019.pdf)

## CORNER

COOK'S

### Chestnut & Chicken Meatballs

*This recipe is courtesy of Chestnuts Australia and can be found at [www.chestnutsaustralia.com.au/project/chestnut-chicken-meatballs](http://www.chestnutsaustralia.com.au/project/chestnut-chicken-meatballs). Find more recipes at [www.chestnutsaustralia.com.au](http://www.chestnutsaustralia.com.au).*

#### INGREDIENTS

- 250g cooked and peeled chestnuts, finely chopped
- 500g chicken mince
- 1 small onion, finely grated
- 2 garlic cloves, finely chopped
- 1 tsp finely grated lemon zest
- 1 egg, lightly beaten
- 1/3 cup flat-leaf parsley leaves, finely chopped
- 1/2 cup dry white wine
- 1/2 cup chicken stock
- 2 tbsp Dijon mustard
- 200ml reduced fat sour cream
- 50g baby spinach leaves
- Pasta, mashed potatoes, or rice, to serve

#### PREPARATION

*To make the meatballs, combine chestnuts, chicken, onion, garlic, lemon zest, egg and parsley in a large bowl. Mix until well combined. Roll mixture into 18 meatballs. Place onto a tray, cover and chill for 20 minutes.*

*Heat oil in a large non-stick frying pan over medium-high heat. Add meatballs and cook, turning often, for 5 minutes until evenly browned. Remove meatballs from pan and set aside.*

*Add wine to pan and cook for 1 minute. Stir in stock, mustard and sour cream until well combined. Add meatballs to pan. Reduce heat to medium-low, cover and simmer, stirring occasionally, for 8-12 minutes until meatballs are cooked through. Toss through spinach. Season to taste. Serve with pasta, mashed potatoes, or rice. Serves 4.*

2019

Michigan Chestnut Management Guide



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USDA This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under Agreement No. 2015-09785. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

### 2019 - 2020 CGA Slate of Officers:

*President:* Roger Blackwell

*Vice President:* Derek Waltchack

*Secretary/Treasurer:* Jack Kirk

*Directors:* Steve Jones, Greg Miller, Tom Wahl, Luke Wilson

*According to the bylaws, the slate shall be considered to have been elected unanimously if no written petitions are received. These directors and officers will take over at the conclusion of the annual meeting.*

# Outreach on the Airwaves: A New Agroforestry Podcast

By Dr. Mike Gold and Hannah Hemmelgarn, University of Missouri Center for Agroforestry

*Chestnut Growers may be interested in a brand-new Agroforestry Podcast from the University of Missouri Center for Agroforestry.*

OVER THE LAST FEW YEARS, podcasts have become a popular way to glean new information, inspire new ideas, and connect interested learners with topic-area experts. Podcasts are digital audio files made available electronically for download or direct listening. Generally, podcasts are produced as a series, new installments of which can be received by subscribers automatically. According to Edison Media Research, at least 24% of Americans have listened to a podcast in the last month.

Several podcasts on farming and food systems are currently available from the National Sustainable Agriculture Information Service, USDA Sustainable Agriculture Research and Education, and independent producers, although none are focused explicitly on agroforestry, and few highlight agroforestry as a featured topic more than once. An opportunity exists to highlight perennial agriculture practitioners, suppliers, buyers, and educational resources through this modern avenue of information transfer.

By producing a series of agroforestry podcast episodes on topics ranging from forest farming medicinal plants, silvopasture establishment successes,

specialty crop marketing, financial incentives for conservation-based agriculture and much more, the Center for Agroforestry and contributing partners will:

- Broaden the reach of agroforestry information and resources to a growing audience of podcast listeners;
- Inspire farmers and landowners to connect with agroforestry practitioners, suppliers, and buyers;
- Share information about regional events; and
- Familiarize listeners with ecological, social, and economic concepts central to agroforestry.

Since its launch in January, two episodes have been released. The first, “Insights from Agroforestry Change-Makers,” features Dr. Michael Gold, Keefe Keeley, Dr. Sarah Lovell, Kate MacFarland, and Dr. John Munsell. In the second, “Forest Farming 101,” forest farming experts Dr. Jeanine Davis and Dr. Eric Burkhart share the fundamentals of forest farming, from site selection to medicinal plant cultivation and harvest. Recordings from the Appalachian Beginning Forest Farmer Coalition grower expo also offer tips from



forest farmers who make a living from the sustainable management of forest-grown medicinal plants.

Subscribe to The Agroforestry Podcast on your preferred podcast app and stay tuned as we share the multitude of ways farmers, land stewards, researchers and educators are working to reintegrate diverse woody perennial plants into multifunctional landscapes. You can also find the podcast on the Center for Agroforestry’s website at [www.centerforagroforestry.org/pubs/podcast.php](http://www.centerforagroforestry.org/pubs/podcast.php).

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We have Yixin (Large Nut) and Yixin (Great Flavor) in our germplasm repository but have not yet collected data on these trees due to the lack of available labor.

The jury is still out on Szego. It has produced large amounts of large-sized chestnuts, however, it is also showing signs of chestnut blight infection via bark swelling and some bark death. We are not sure if Szego will continue to be productive into its late teen years or not. We only have one mature tree to base this upon. One drawback is that the nuts tend to fall inside the bur. So, while large, they are still a pain to harvest since you have to kick open almost all the burs to get at the little gems. We are outplanting more grafted Szego to get better numbers down the road.

Fortunately, we do have a new nut tree breeder, Ron Revord, joining our Center in June 2019 as an Assistant Research Professor. Ron will take over the work of Dr. Mark Coggeshall, who led the Center’s tree improvement and genetics research from 2000 – 2017. Ron’s responsibilities with the Center will include the continuance of ongoing applied breeding programs for Chinese chestnut, pecan, and black walnut, along with new initiatives related to restoration of the Ozark chinquapin and initiation of new work with hybrid hazelnut. The long-term goal of the Center’s tree improvement research is to release stable and reliable tree crop varieties to Missouri growers while continuing to grow a base of genetic resources and knowledge that will enable

the successful inheritance of this program and its multigenerational success. Ron is also a co-founder and current Chair of the Board of the Directors for the Savanna Institute (SI), a 501c3 non-profit organization dedicated to participatory agroforestry research in the Midwest U.S. SI works with farmers to build upon agroforestry science and aid adoption. Ron’s diverse interests will make him a great resource for chestnut growers.

*Learn more about the ongoing research at the HARC: [harc.missouri.edu](http://harc.missouri.edu)*

# A Guide to Chestnut Pollen Production, Transport, and Orchard Design

By Bernie Hilgart, Washington Chestnut Company | [chestnuts.wa@gmail.com](mailto:chestnuts.wa@gmail.com)

When chestnut growers talk about pollen production in their orchards, some persistent questions are often discussed:

- Are some chestnut cultivars pollen-sterile?
- Are some chestnut cultivars excellent pollen producers?
- How important is bloom timing?
- Is there a timing difference between male and female blooms?
- How is pollen transported between male flowers (catkins) and female flowers?

In these questions, pollen production, timing, and transport are the key issues being addressed.

## Pollen Basics

First, let's get down a few basic principles about chestnut production as it relates to pollen production.

1. The more energy a chestnut tree puts into pollen production, the less energy is available for nut production. Trees that produce lots of pollen usually produce fewer pounds of chestnuts.
2. Lots of pollen in an orchard does not equate to higher nut set. Environmental factors such as weather, soil nutrients, and soil moisture can cause chestnuts not to set nuts.
3. There is no such thing as a pollen-sterile chestnut tree. There are chestnut cultivars referred to as sterile, such as *Bouche de Betizac*, *Colossal*, and *Marrisard*. These cultivars do produce small amounts of pollen, but not enough to be considered a pollen producer.
4. Clonally propagated chestnut cultivars will not set fruit with their own pollen. This is referred to as being self-sterile. A *Maraval* will not set fruit from its own pollen or from another *Maraval* tree. This is true for all chestnut cultivars. It is not true for seedlings of pollen-producing chestnut trees, since seedlings are not clonally propagated.

## Pollen Transport

Pollen transport is an important matter in getting the pollen from the male catkins to the female flowers. There are two transport mechanisms for transporting the pollen: insects and wind. Experts have not been able to agree on which of these two mechanisms is most important to chestnut production. Casual observations in orchards demonstrate that wind may be the primary transport mechanism. We also observe lots of insects on the blooms. Chestnut blooms do not appear to produce nectar, so the insect activity is in the collection of the protein-rich pollen from the male catkins.

So, if wind is the primary mechanism of pollen transport, how far is pollen transported by the wind? We have to go back into the orchards to find evidence of the transport of pollen to female flowers. Casual observations in chestnut orchards have shown a good pollen-producing tree such as *Prococe Migoule* can have nearly 100 percent effective pollen transport over 60 feet from the tree. As the distance from the tree increases, effective pollen transport diminishes until about 120 feet. At a distance greater than 120 feet away from a good pollen producing tree, very few nuts are set.

Just transporting the pollen from the male flowers to the female flowers is not good enough. Both must be in bloom at the same time. Overall, if you have all European hybrid chestnut cultivars, or have all Chinese cultivars, timing is less of an issue than if you have a mixed orchard of both European and Chinese trees. Normally, the Chinese chestnut trees bloom earlier than the European trees. If your orchard uses *Colossal* as your primary producer, then you would not want to use Chinese chestnut cultivars or Chinese seedlings for pollen production because of the difference in bloom times.

Traditionally, commercial chestnut orchards have used 2-3 cultivars. For example, you may use *Colossal* as the primary nut producer and *Prococe Migoule* for pollen production. Some orchards will



*Belle Epine chestnut tree in bloom.*

add a third pollen-producing tree such as *Marsol*, *Marigoule*, or *Maraval*. Adding a second pollen-producing cultivar helps with risk management if one of the pollen-producing cultivars is unable to produce pollen in a particular year. In orchards where the primary nut producer is a *Bouche de Betizac* or a *Colossal*, cultivars labeled as sterile, and there is only one other pollen-producing cultivar present, the pollen-producing cultivar also sets nuts. This is because the primary nut-producing cultivar does produce some pollen, but not enough as if there were only two standalone trees, one sterile tree and one pollen-producing tree.

## Orchard Design

There are several designs for distributing pollen-producing cultivars in orchards using pollen-sterile cultivars for nut production. When selecting a design, wind direction during the bloom is the primary factor in the selection process. Let's assume a chestnut orchard is located where the wind changes direction during the day, coming from the east in the morning and then from the west in the afternoon. In a simple block layout of 9 trees, blocks can be assembled next to each other for the entire extent of the orchard. Here is a simple 9-tree block design where "N" is the primary nut producer and "P" is the pollen producer:

Block #1			Block #2		
N	N	N	N	N	N
N	P	N	N	P	N
N	N	N	N	N	N

*Continued on next page...*

The Chestnut Grower



# Washington Chestnut Company

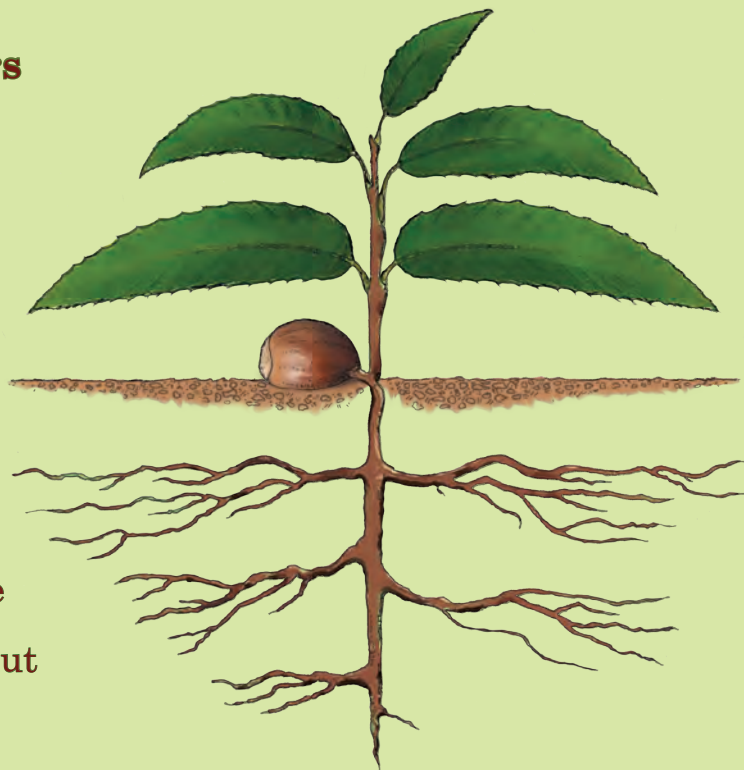


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Marsol  
Marigoule  
Marrisard  
Bisalta #2  
Bisalta #3  
Belle Epine  
Gillet  
Szego  
Regis Montis  
Regina Montis  
Marrone di Comballe  
Marrone di Marradi  
Pure American Chestnut  
Bergantz  
...and more!



Our web site has full descriptions of each cultivar and lots of help with growing chestnut trees.

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

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

Continued from page 8...

Here is example using two different pollen producers, P1 and P2:

Block #1	Block #2	Block #3	Block #4
N N N	N N N	N N N	N N N
N P1	N N P2	N N P1	N N P2
N N N	N N N	N N N	N N N

In locations where the wind always comes from the same direction, say right to left, then the block layout would look something like this:

Block #1	Block #2
<<<< wind direction	
N N N	N N P
N N P	N N N
N N N	N N P

Here is another example using two different pollen producers, P1 and P2, where the wind always comes from the same direction:

Block #1	Block #2	Block #3	Block #4
<<<< wind direction			
N P1	N N P2	N N N	N N P1
N N N	P2 N N	N N P1	N N N
N P2	N N P1	N N N	N N P2

Whatever the layout design of the orchard, there should be at least 11 percent pollen-producing trees. Many orchards are designed with about 15 percent pollen-producing trees.



Maraval chestnut tree in bloom.

### Other Factors

The soil nutrient and moisture components of the orchard are very important. Deficiencies in soil nutrients can and will result in lower than expected production in nut quantity, nut quality, and nut size. Consider performing soil and leaf sampling every year and sending the samples to a reliable lab. Keep records of the lab results so you can adjust your orchard practices to achieve the highest production possible.

In the game of chestnut production, you will need to play by the rules and put a game plan together to deliver a highly productive orchard. Customers expect chestnuts to be available year after year without interruption, in high quality, easy to peel, and good tasting. Most success stories have hard work, a great plan, and excellent execution in them. Hopefully, your orchard will someday exceed your expectations. 🍅

## 2019 Annual Meeting Info

The Chestnut Growers of America Annual Membership meeting will be held June 7-9<sup>th</sup>, 2019 at the W.K. Kellogg Biological Station in Hickory Corners, MI. The program will include expertise from around the country addressing invasive pests, marketing, chestnut genetics, and so much more. The event will include a cocktail reception, a walking tour of the facility grounds, and optional orchard tours.

### Registration

Early bird registration is **\$260 for members and \$280 for nonmembers through May 7<sup>th</sup>**. After May 7<sup>th</sup>, the registration fee is \$300 for both members and nonmembers. **Registration closes on May 31<sup>st</sup>**. Registration includes **lodging**, a reception on June 7<sup>th</sup>, meals on June 8<sup>th</sup>, breakfast on June 9<sup>th</sup>, and meeting materials. Each individual must register separately. Register by visiting [https://msu.co1.qualtrics.com/jfe/form/SV\\_0V4j8ScRONWZLVz](https://msu.co1.qualtrics.com/jfe/form/SV_0V4j8ScRONWZLVz).

### Payment

**Registration must be paid in advance via check or PayPal.** For questions about payment, please contact Treasurer Jack Kirk at [jackschestnuts@gmail.com](mailto:jackschestnuts@gmail.com).

**Checks:** Mail to Chestnut Growers of America, Inc., Attn: Jack Kirk, 2300 Bryan Park Avenue, Richmond, VA 23228. Please note the purpose of your payment in the check memo section (e.g., "John and Jane Doe's Registration").

**PayPal:** Via [www.chestnutgrowers.org/paydues.html](http://www.chestnutgrowers.org/paydues.html) (scroll down to "2019 Annual Meeting Registration Fees").

### Lodging

Lodging is on-site and included in the registration fee. When you register you will provide your preferences and don't need to make any further arrangements. Lodging at KBS is adequate but spartan in nature. Visit the KBS page ([conference.kbs.msu.edu/stay/lodging](http://conference.kbs.msu.edu/stay/lodging)) for more information on their **lodging facilities**.

### Directions

The CGA Annual Membership Meeting will take place primarily at the KBS Conference Center, visit [conference.kbs.msu.edu/about/directions](http://conference.kbs.msu.edu/about/directions) for **directions, parking information, and a facility map**.

### Airports

The Gerald R. Ford International Airport (Grand Rapids) is closest to the venue (40 miles), but the Detroit Metro Airport is also an option (119 miles). Both airports provide information regarding ground transportation on their websites.

For more information about the program, contact CGA President Roger Blackwell at [rblackwel@comcast.net](mailto:rblackwel@comcast.net) or (810) 923-2954.

## For Sale / Seeking

SEEKING: Scion wood of Bergantz chestnut. Exchange possible. Contact: Davor Juretic, [juretic.davor@gmail.com](mailto:juretic.davor@gmail.com).

FOR SALE: Comm Chestnut Orchard + Home. N. Calif. Klamath River frontage. Appx. 800 Trees Colossal/Nevada. Trees are 20+ years old. Modern home 3+2; appx 2000 Sq. Ft. Off Grid - Solar Power; 55 Acres Total. Viewable on Google Earth. Website: [rockybarchestnuts.com](http://rockybarchestnuts.com). Link to Flickr for additional photos. Seller carry; \$595,000. Email: [Dhenn@dantel.com](mailto:Dhenn@dantel.com); Tel: (352) 633-6185.

### \*\*YOUR AD HERE\*\*

CGA members can post equipment or other items they want to buy or have for sale, free. Send your submissions to the editor at [chestnutgrowersofamerica@gmail.com](mailto:chestnutgrowersofamerica@gmail.com).

FOR SALE: Savage model 5132 Blower-540 RPM. Excellent condition w/ very little use! Contact Louis Naeger @ 314-724-9267.





# You Don't Want to Miss it!

## The Chestnut Growers of America 2019 Annual Meeting

June 7-9, 2019

WK Kellogg Biological Station Conference Center  
3700 Gull Lake Drive, Hickory Corners, MI 49060

### Friday, June 7

6:00-9:00 p.m. Registration and Social Gathering with Cash Bar and Appetizers *Terrace Room*

### Saturday, June 8

7:00-8:00 a.m. **BREAKFAST** *McCrary Dinning Hall*

8:00-8:30 a.m. Welcome & CGA Business Meeting *Auditorium*  
*Roger Blackwell, CGA President*

8:30-9:30 a.m. Ancestry Informative Markers for Chestnuts Project Update *Auditorium*  
*Dr. Jeanne Romero-Severson, Notre Dame University*

9:30-10:15 a.m. Asian Gull Wasp in Michigan Update *Auditorium*  
*Louise Labbate, Department of Entomology, MSU*

10:15-11:00 a.m. Chestnut Disease Update *Auditorium*  
*Dr. Monique Sakalidis, MSU Dept. Plant, Soil & Microbial Sciences*

11:00-11:45 a.m. Pest Management Considerations for 2019 *Auditorium*  
*Erin Lizotte, Michigan State University Extension*

12:00-1:00 p.m. **LUNCH** *McCrary Dinning Hall*

1:00-1:45 p.m. Chestnut Tissue Culture Update *Auditorium*  
*Mario Mandujano, Rogers Reserve, MSU*

1:45-2:45 p.m. Chestnut Annual Marketing Survey *Auditorium*  
*Dr. Mike Gold, University of Missouri*

2:45-3:30 p.m. Food Safety on the Farm *Auditorium*  
*Speaker TBA, Michigan State University Extension*

3:30-4:15 p.m. Postharvest Heat Treatment Update *Auditorium*  
*Dr. Dan Guyer, Biosystems and Ag Engineering, MSU*

4:15-5:00 p.m. Changing Chestnuts from being classified as an Allergen Nut *Auditorium*  
*Luke Wilson, Chestnut Grower*

5:00 p.m. Adjourn for break

6:00-7:00 p.m. **DINNER** *McCrary Dinning Hall*

7:30-8:30 p.m. Show and Tell – General Get Together Discussion *Auditorium*

### Sunday, June 9

7:00-8:00 a.m. **BREAKFAST** *McCrary Dinning Hall*

8:30-10:00 a.m. CGA Board Meeting *TBD*

11:00 a.m.-1:30 p.m. Field Tours:  
Chestnut Growers, Inc. Receiving Operation in Clarksville, MI *9302 Portland Road  
Clarksville, MI 48815*  
Roger Beyer Chestnut Orchard in Paw Paw, MI *37360 52nd Avenue  
Paw Paw, MI 49079*

### Venue

The [W.K. Kellogg Biological Station](#) (KBS) is Michigan State University's largest off-campus education complex and one of North America's premier inland field stations. KBS is a premier site for field experimental research in aquatic and terrestrial ecology that takes advantage of the diverse managed and unmanaged ecosystems. The varied habitats of KBS include forests, old fields, streams, wetlands, lakes, and agricultural lands. Located between Kalamazoo and Battle Creek, Michigan, the 3,873 acre station includes [W.K. Kellogg Bird Sanctuary](#), [W.K. Kellogg Farm](#), [KBS Academic and Research Facilities](#), [W.K. Kellogg Conference Center and Manor House](#), and Lux Arbor Reserve. The nearby [W.K. Kellogg Experimental Forest](#) is closely affiliated with KBS.





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Chestnut Ridge of Pike County, IL