



CHESTNUT CHAT – Q & A
CHAT # 22: EXPLORING BIG QUESTIONS FOR AMERICAN CHESTNUT RESTORATION
DATE: FRIDAY, MARCH 19, 2021

QUESTION	ASKER NAME	ANSWER(S)
I understand you will be planting chestnut trees on Beebe Hill Road in Falls Village. Will you need any help?	joan robinson	"live answered"
Hi Joan - drop me a line and I'll see if I can find out more about this planting and connect you with someone involved: kendra.collins@acf.org"		
Hello Again and Thank You for these Chats. Really enjoyed the February chat and this is my second. Walter Cwynar Chairman Plainfield Connecticut Conservation Commission	Anonymous Attendee	Excellent! thanks for coming back!
What is the difference with the Restoration Chestnut from a few years back and the transgenic Darling?	Jonathan	Hi Jonathan - the "Restoration Chestnut" is the product of traditional breeding, attempting to incorporate a resistance from Chinese or Japanese chestnuts into an American background. The transgenic Darling has used genetic modification to insert a gene from wheat (OxO) into an American chestnut background. At this time, the transgenic Darling exhibits greater blight-resistance than the Restoration Chestnut. Both are being improved all the time.
Chestnuts existed interactively with other species - have any of *those* species disappeared or been altered in some way - that you know of! (I know these situations are not completely known.)	Susan Treesh	live answered
Yes-CT	joan robinson	live answered
How can I get my 30 foot tall 11 year old American Chestnut with no blight pollinated with something that might produce more blight tolerant seedlings.	Thomas Levesque	American chestnuts can be crossed with other chestnut species that have natural resistance to blight - ie, Chinese, Japanese, or hybrid chestnut. You could either plant a more resistant type of chestnut to be a pollination partner (once it starts flowering) or you can hand-pollinate your tree with pollen from something similar. You might also reach out to the local TACF Chapter in your area to see if there may be other interest in pollinating your tree: https://acf.org/our-community/find-a-chapter/



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It intersects Route 7	joan robinson	live answered
What are my options for planting chestnut trees on my farm in NE Kansas?	Ivan James	live answered
How is it going with USDAs (potential) approval of the gene edited chestnut plants? Where can you find updates about it?	Jakob	live answered
Do you have any advice on controlling the weevil?	gritter	"See pg 17 of our Sept 2010 issue of our magazine for a good overview: https://acf.org/wp-content/uploads/2016/09/Volume-XXIV-No.-3-September-2010.pdf
Assuming decent soil, what percentage of American Chestnut nuts are viable? In past years, I've had a high percentage of nuts successfully emerge into plants. This year, I only have gotten 4 out of 10 to emerge in my small sample size, making me wonder what is typical?	Lawrence	"This can really vary, especially with such a small sample size. Chestnut relies on cross-pollination with another flowering chestnut to produce viable seed. If the available pollen load for cross-pollination was reduced in some manner, that can have an impact. If the nuts all appeared to be viable at harvest, there could have been an issue in storage. https://acf.org/wp-content/uploads/2020/02/FactSheet_HARVEST_February2020_rev.pdf
On average, we see 2 viable nuts/bur (out of a possible 3) with open-pollination."		
TACF has a multitude of wild-type American chestnut orchards in most of the chapters.	Ken	Yes, we do! These are primarily germplasm conservation orchards (GCOs).
Our farm is in Westmoreland county PA. We have 1 Chestnut tree that look like a bush. It is about 30 ft high with lots of shoots. It gives chestnuts.	Roxanne	"Great - thanks for sharing! If you'd like to make a formal report of your tree so we can add it to our database you can find our Tree Locator Form and instructions here: https://acf.org/resources/identification/
I am a Director of the PA/NJ chapter of TACF. I live in Gibsonia. If you would permit, I'd like to come see your		



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tree and share contact information for the scientists. You can reach me at gsjbaugh@verizon.net ."		
Who is monitoring the 10 or so Syracuse U GMO trees on the property of Mohonk Presrve in Ulster County, NY?	Peter Lane	"Hi Peter -- I am all but certain those are wild-type American trees, not transgenic.
Yes, I planted those 10 trees (now 8), and Sara is right. They are wild-type. Not surprisingly, some are infected with blight. I am hoping that some survive long enough to be pollinated with transgenic pollen from SUNY-ESF Syracuse. Wow, thanks, Sarah and Gail. We'll be at Mohonk before too long and take a look at them again."		
Why is there no coordinator selecting the best wild type American chestnuts from all the mother orchards in the different chapters and using the most resistant seed to open pollinate in one place so that recombination through sexual reproduction can be used to breed.	Ken	Hi Ken - I see Kendra typing an answer out for you to one of your previous questions. I think she'll get some good information for you, in addition to the other question I answered as wel.
Instead everything is about GMO's and hynrids.	Ken	live answered
Why does TACF use Elbert L. Little's 1977 map of the chestnut range? That was the range as of 1977, after blight and root rot, not the range prior to Columbus. Little stated that in his 1979 book.	Roger Willby	"The short answer is that it's the most modern, citable range map available. That said, Sara Fitzsimmons published a 2-part article series on chestnut range maps in Chestnut. Part 1, which looks at the older range maps, is in the fall 2019 issue, which is posted on-line (pg 18). The second part, which focuses on Little and the more modern mapping efforts, was publisehd in 2020 and unfortunately not available on-line yet. If you don't still have a hard-copy let me know and we can see if we can send that electronically.
https://acf.org/wp-content/uploads/2020/12/FINAL_Chestnut_Fall2019.pdf		



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disregarding urbanization. is there any difference in a carbon offset from a forest range with chestnut vs. current forest composition	Christopher Craig	Hi Christopher - Not in a huge measurable amount. American chestnut doesn't provide any great Carbon off-set over other similar trees, like oaks. American chestnuts do grow faster, so that's a slight advantage. With disease resistance, American chestnuts could be long-lived but, again, so are other tree species like oak or pine.
Why is no serious work being done by TACF along the lines of ACCF on wild type trees. Seems as all the energy for the last 38 years has been toward hybrids and now GMO's.?	Ken	The ACCF has focused primarily on this effort, while TACF has focused on a variety of methods of tree improvement. We are doing our best to utilize all possible tools in the toolbox and do have a small program devoted to these "large surviving Americans" (LSAs). Within that project we are in the process of genotyping LSAs to see if we can glean anything about why some of these trees do show better resistance than most of the species. This is one of many lines on inquiry towards our on-going understanding of available blight-resistance mechanisms.
c. I don't know if these are different species	Terry Smith, North Carolina	
different species	ericmassant	
c	Joe Toman	
Look like Oaks	Bill	
If cryphonectria is a wound pathogen has anybody had success protecting large castanea dentata stems from infection by using a bark paint like the white latex paint used on fruit trees to prevent spores from entering in bark fissures	Michael V	Not that I'm aware of. Chestnut blight can set-up in the cambium under the bark on any part of the tree - coming in through wounds or natural cracks in the bark. To protect a tree in this manner you would need to paint the entire tree. There is some gas exchange that happens through the bark so not only would this be difficult to keep up with, you might effectively suffocate the tree.
To Robert, Are these Red Oak and White Oak	Pat Peterson	Yes! Good eye!
Do those oaks cross with each other naturally. I think not, so separate species.	John Hempel	live answered



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Burham in the old days wanted to see a blight free tree in his lifetime, so we got the hybrid trees. I heard Darling say the same thing, so we get the GMO trees. Why no pursuit of wild type breeding the old fashioned way? I sit all about shortcuts? TACF is uniquely set up to breed with wild type trees with so many mothee orchards. Why not natural selection from these orchards?	Ken	Hi Ken -- We do cross "Large Surviving Americans" or LSAs. We have a small line of orchards dedicated to that. Technically, though, there is another organization, the American Chestnut Cooperators' Foundation (ACCF) who was doing a majority of w/in species crossing.
natural selection process takes even longer,	Dan Phillips	
What is the Chinese Academy of Science doing with the transgenic editing of the Chinese Chestnut, which had some vulnerability to the blight?	Michael Ronayne	I am honestly not familiar with what transgenic work is being done in China, on Chinese chestnut. The research team at ESF may be more up to date on any efforts - https://www.esf.edu/chestnut/
Right the mother tree orchards are set up primarily for backing up the hybrids and GMO's.	Ken	
They should be set up for selection through surviavl of the fittest with open pollination like takes place naturally.	Ken	
We will need trees that can survive real time environment issues.	Ken	
We need trees that can survive ib a forest situation.	Ken	
In the breeding program, has any research be done with chromosome doubling (i.e. Polyploidy)? Both the American and Chinese Chestnuts would have to be doubled first.	Michael Ronayne	In TACF's breeding program this has not been a focus. I can't speak to other breeding efforts, as many things have been tried. That said, chromosome doubling is not something that I have heard discussed within the chestnut research community.
Participated in the Boone County webinar last evening. There was inquiry about who was going to profit from the transgenic tree. The presumption of the person who asked the question is that big AG owns the research. I suggest it's really important that you (collectively) make it	Steve Johnstonbaugh Pittsburgh	"Participated in the Boone County webinar last evening. There was inquiry about who was going to profit from the transgenic tree. The presumption of the person who asked the question is that big AG owns the research. I suggest it's really important that you (collectively) make it crystal clear that there is no direct financial gain by the scientists (patents, licensing, fees etc.) University OR big AG. The



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crystal clear that there is no direct financial gain by the scientists (patents, licensing, fees etc.) University OR big AG. The question was addressed by Erik Carlson - but he's not a sales guy or a politician :) I say put it right out there for the public to see - NO PATENT, transgenic tree will be public domain period. This is a brilliant ethics solution.		question was addressed by Erik Carlson - but he's not a sales guy or a politician :) I say put it right out there for the public to see - NO PATENT, transgenic tree will be public domain period. This is a brilliant ethics solution. Hi Steve -- yes! this is a topic we are absolutely tackling. and yes, you are correct - it's vital that we separate the goals of this work (forest health) from those of commercialization."
TACF has all its seeds in the same basket. Natural breeding is and has been virtually ignored...there is a legitimate alternative with old fashioned breeding, it has no shortcuts and takes more time.	Ken	Hi Ken - As both Kendra and I have answered in your previous questions, that work is being done. There are not many trees in the native range which actually have resistance, and the amount of resistance in those trees is not incredibly high, so it doesn't get as much coverage as the other techniques.
Wouldn't a better sense of ecosystem services provided by a "species" and and a more quantitative assessment of the ecosystem role of an organism help clarify whether differences are significant?	Mike Aucott	live answered
Does anyone know the status of the great Lovell, ME american chestnut? It is wild, survived the blight and is approximately 115ft tall. I've heard nothing new since its discovery over 5 years ago.	carettib	As far as I know, it's still chugging along. It's in an isolated location and we have seen a few larger trees in the same region, though blight has taken out a few of them. We don't expect the Lovell tree to have any resistance but I <i>*think*</i> our ME Chapter has worked to collect scion material for grafting (it does not have a pollination partner) so we can include it in our germplasm collections.
Tangential question re. the refugia - has anyone ever looked at what was in the Yucatan 10Kyr ago?	John Hempel	live answered
Can you give a quick response to the question of how chestnuts originated and diverged? Are they older than the separation of the supercontinent?	Scott Deitchman	live answered
Thanks. Can you put the citation for the paper in the chat? Appreciate it!	Scott Deitchman	https://doi.org/10.1016/j.ympev.2006.07.022



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		Lang, P., Dane, F., Kubisiak, T. L. & Huang, H. Molecular evidence for an Asian origin and a unique westward migration of species in the genus <i>Castanea</i> via Europe to North America. <i>Mol. Phylogenet. Evol.</i> 43, 49–59 (2007)."
Sara, could you paste info (author name, etc.) on the paper you mentioned about divergence of the chestnut family?	Mike Aucott	" https://doi.org/10.1016/j.ympev.2006.07.022 Lang, P., Dane, F., Kubisiak, T. L. & Huang, H. Molecular evidence for an Asian origin and a unique westward migration of species in the genus <i>Castanea</i> via Europe to North America. <i>Mol. Phylogenet. Evol.</i> 43, 49–59 (2007)."
Sara, what's the citation for the chestnut paper you just mentioned - how did Am. chestnut get to N. Am. from China?	hmcnab	" https://doi.org/10.1016/j.ympev.2006.07.022 Lang, P., Dane, F., Kubisiak, T. L. & Huang, H. Molecular evidence for an Asian origin and a unique westward migration of species in the genus <i>Castanea</i> via Europe to North America. <i>Mol. Phylogenet. Evol.</i> 43, 49–59 (2007)."
Hi Sara, yes there are many mother wild type orchards planted by TACF. I have seen no coordinated effort and it is not all about resistance. The trees need to be selected for a forest environment dealing with deer, voles, mice, frost, drought, Japanese beetles, weevils, flooding, germination, pollination and much more, not only blight resistance. If you took the best seed from all these orchards and bred them you would have a very nice alternative breeding program that everyone could get involved in. Often I read don't plant too many mother trees because they won't survive anyway. I have issues with that approach as you are leaning too much towards cloning and not enough towards natural selection.	Ken	Hi Ken - I expect that if you got more involved with your local Chapter (where are you located?) you'll see that we actually DO spend a lot of time worrying about diversification and adaptive capabilities. We encourage all people to plant wild-type American chestnuts, and that it's the best way for anyone to get started with this work. I personally have written articles on that topic several times in the last several issues of the Chestnut magazine. We prefer people plant at least 100 or more wild-type American chestnuts as part of what's called a "GCO" or "Germplasm Conservation Orchard".
Ownership? State/federal land vs private landholder. Private landowner can plant any chestnut - chinese - japanese - american. what is restoration?	Jim C	live answered



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Was there any significant advantages to any species within the eastern forests as a result of the functionally extinct status of the American Chestnut?	Thomas Levesque	
I live in the white area of NY State. Is it white due to glaciers or some other reason that explains why I'm having trouble getting Chestnuts to grow?	Charles Klaer	"I'm not familiar with the area, but in general chestnut prefers a well-drained, slightly acidic soil. If the white color comes from limestone deposits you could be dealing with a higher pH than chestnut will tolerate, but just speculating. You can read more about site selection here: https://acf.org/wp-content/uploads/2019/06/Factsheet_HowToGrowChestnuts_2019.pdf If you have further questions about getting your trees to grow you could reach out to the appropriate science coordinator for your area: https://acf.org/contact-tacf/
Evelyn is SOOOO right on!	Ken	
received. Thanks again! BTW, I discovered that it's not open access but USFS has it posted at https://www.srs.fs.usda.gov/pubs/ja/ja_lang001.pdf	Scott Deitchman	Great - thanks for sharing that!
Sara, do you select from the GCO orchards to improve the trees ability to survive and if not, why not? All great work you do. Seems like there should be a coordinator for the GCOs that takes from orchards in all the chapters.	Ken	Hi Ken - Yes, but very few American chestnuts in GCOs actually have increased survivability over others. For example, in our GCO at Tyler Arboretum outside Philadelphia, there's one line that does better than another. And we have used that in other crosses. There's the "Ort" tree in SE PA, the Adair County tree in KY, the Amherst tree in VA --- all of these trees with greater survival over other wild-type trees. They have been bred with one another and do exist in different GCOs. They do provide higher resistance than 99.9% of other wild-type trees.
I really appreciate Dr. Brister's reference to Palmer's framework for thinking about "wildness." How should we deal with the reality that various peoples might add other categories to Palmer's list, or might answer the question for the GE chestnut differently than the way Brister does?	Jason Delborne	live answered



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How do philosophers help us think through these areas where perspectives differ on these important questions?		
"If humans have introduced a disease into plants, why is that different than doing the same thing in humans like COVID for instance? In the medical profession we think we have to treat diseases in humans, how could it be a different ethic to do the same thing for plants? Margaret Craven, M.D."	Margaret Snowden	live answered
From Bruce Byers, Falls Church, VA. Thank you for the "two types of arrogance" analysis, very helpful! I take it you think restoring GMO chestnuts would pass the tests?	Bruce Byers	*I* think restoring chestnuts with a GM variety *could* pass these tests. TACF, in particular, has been very thoughtful in terms of thinking through restoration in a way that is not overly hasty, is evidence-based, and that pursues multiple strategies at once, but carefully. I think the reason it is working this way for chestnut restoration is that the scientists and practitioners who are involved have a shared goal—restoring the chestnut for its own sake. Bill Powell, for instance, emphasizes that there is an assay that will make it possible to monitor spread of the GM variety, and that when the GM variety reproduces, ~50% of offspring will be wild-type trees. This is an example of incorporating techniques that can be modified if problems do appear, and the attitude of the SUNY-ESF team has been responsive to concerns about hubris or arrogance.
Evelyn's second to last slide appeared to be of a forest of ash trees soon to be doomed to the fate of Chestnuts and Dutch Elms. It appears multiple generations of humans will be aging out before the ethical questions related to Crisper Cas 9 editing get resolved.	Charles Klaer	It's *actually* a picture of a dead chestnut that Rob Laport pointed me to at the University of Rochester! I took the photo last month, and the trees in the background are oaks and hickories. But your point is valid—the threats to forest health are great, and restoring the chestnut gains additional importance because of what happened to elms and what is happening to ash, hemlock, beech, and other trees. The ethical questions are serious, and the consequences of bad decision-making could be terrible! But the consequences of inaction are also to be feared because the threats are increasing.



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how long does it take the blight to kill the chestnut	Russel Boyer	Hi Russel - depends on the size of the tree and how much resistance it has. A small tree with no resistance can be killed in less than 3-6 months. A larger wholly susceptible tree can hang on with blight for a few years, but usually not more than 5 or so.
thank you . Ed and I will do both- Register and contact Steve. Wonderful program so far.	Roxanne	
ok I have two chestnut trees	Russel Boyer	
There are so many diseases/insects attacking a wide variety of tree species causing large tracts of trees being lost. Unfortunately, we are often told when doing reforestation, to not plant these dieing species because they will just succumb and die. I feel we should continue planting some of these species in the hope that some will survive, grow strong and produce offspring that might be resistant to these diseases..	Pat Peterson	Hi Pat - I agree, especially in terms of conserving diversity of these trees. We (TACF) highly promote what we call "GCOs" or Germplasm Conservation Orchards". Conserving diversity of these native species, and having them readily available for diversification as disease and pest-resistance technologies improve. The key is to determine the underlying diversity of a given threatened species and ensure that the breadth of that species is collected and conserved - not just 1000 trees from one location, but a wide variety of place and adaptive locations.
Your thoughts please.	Pat Peterson	
how old is the chestnut tree in teenese	Russel Boyer	Hi Russel -- I'm not sure I understand your question. do you mean how long has it been in Tennessee? Or what is the oldest American chestnut tree in Tennessee?
yes	Russel Boyer	Hi Russel - apologies but not sure what you are responding to. I see Sara had asked you a few questions. Could you type out your full/specific question so we might be able to help?
Biology crosses borders, in general. What is particular about either the chestnut tree or these Native American borders that makes this issue different than the cross-border effects that any polity has on its neighbors when it affects its environment?	Anthony Sutton	live answered



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We're there comments by indigenous groups to the transgenic petition? If so how would you characterize them?	Don McCann	Hi Don - the only indigenous comment I'm aware of was from the Eastern Band of the Cherokee Indians (EBCI) and it was extremely positive.
ok i am 8 years old	Russel Boyer	:) no worries - just want to help with your question if we can
Does TACF have a Best Practices white paper for how to best care for chestnut stump shoots? For instance, do you let all sprouts grow or do you selective shoots around the stump to preserve the vigor of the root system for the long haul?	Steve Johnstonbaugh Pittsburgh	Does TACF have a Best Practices white paper for how to best care for chestnut stump shoots? For instance, do you let all sprouts grow or do you selective shoots around the stump to preserve the vigor of the root system for the long haul?
that is fine with me	Russel Boyer	
Thank You Again! Very enlightening, informatve, gives more perspective on the overall TACF project. Walter Cwynar Chairman Plainfield Ct. Conservation Commission.	Anonymous Attendee	Thanks again for joining, Walter!
What tree species "replaced" Am Chestnut and did these replacement trees differ in the chestnut's range?	Gene	This varried across the range. In short, any species co-occurring with chestnut would have expanded to fill the newly available space. No one particular species.
we have a natural chestnut tree, is there any pruning we should be doing-(dead limbs? and when)	Roxanne	Pruning is always dicey on chestnut because you open the tree up to blight with a wound. That said, removing dead or blighted stems is something many do. The best time to prune is when the tree, and presumably the blight, is dormant. And blighted stems should be removed from the site or burned, as the blight will continue to grow on dead wood.
How will remnant populations of Chestnut be impacted by introduction of modified species populations of Chestnut? Could we end up wiping out those remnant populations inadvertantly?	Steven Boyce	



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Is there a way to identify a good location for planting Chestnut trees by looking at existing trees and/or understory. Or do you just use slopes and test the soil?	Greg Thomas	Both - chestnut likes well-drained, slightly acidic soil and there are certainly indicator species for those kinds of sites across the native range.
Great program. Thank you to the panelists.	Gail Whistance	Thanks for joining!
Please offer a zoom version of the Asheville meeting for those of us who can't afford the trip :)	Steve Johnstonbaugh Pittsburgh	Please offer a zoom version of the Asheville meeting for those of us who can't afford the trip :)
END OF CHAT		

