



CHESTNUT CHAT SERIES #32: Cold Tolerance

Q & A

DATE: February 18, 2022

#	Question	Asker Name	Asker Email	Answer
1	I have two trees in my yard in Brunswick, Maine. I realize that Me. is the northern limit of the natural range of the American chestnut. But at a presentation at the national meeting in Portland Me, a speaker suggested that the climate in Maine in 2050 would be similar to the climate in Maryland today. That would seem to bode well for my trees. Do you agree with that projection?	Streetfam	adstreet er@myfa irpoint.n et	Good question for Paul
2	How long does the temperature have yo be held to get cold damage	Frank	Mathob @icloud. com	live answered
3	Can electrolyte leakage be offset through soil treatments i.e. K+, Cl- and Ca+ supplements for vulnerable trees? My understanding is that many northeastern trees - not just the chestnut - are projected to be vulnerable to root damage and subsequent leakage because of diminished snow pack and lack of insulation for frost/thaw cycles.	Julia Africa	jkafrica@ gmail.co m	live answered
4	Why is cold tolerance less in spring versus winter and fall?	Jack Morris	myemail @eamil.c om	live answered
5	where were the chestnut, oak, and maple trees from geographically that were compared for cold tollerance?	Jim English	jenglish @netzer o.com	live answered
6	Elevation vs. latitude was mentioned. I heard a speaker a few years ago state that 1,000 feet of elevation is equivalent to a certain number of miles North of that point (Northern hemisphere). I forget what the number was, perhaps 50 miles, perhaps 200. Do you have such a correlation or rule of thumb?	beebe	beebein nj@gmai l.com	live answered
7	Thank you, Dr. Schaberg! for the wonderful presentation! Greetings from the MS Delta. My location is NOT part of the American Chestnut native range. Also, NOT a cold weather location, but we get our share of dramatic and often unpleasant climate events. Is anyone testing the opposite limit (heat tolerance) for American Chestnuts?	Meg Allen	megalle nathome @gmail.c om	live answered



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7	<p>Thank you, Dr. Schaberg! for the wonderful presentation! Greetings from the MS Delta. My location is NOT part of the American Chestnut native range. Also, NOT a cold weather location, but we get our share of dramatic and often unpleasant climate events. Is anyone testing the opposite limit (heat tolerance) for American Chestnuts?</p>	Meg Allen	megallenathome@gmail.com	<p>Hi meg, Tom Saielli here. I think I can answer this... the only chestnut provenance trial to date is this study in VT. However, we are currently planning additional trials similar to this one, replicated in the north and south (and maybe mid-range). Stay tuned for that work. TS</p>
8	Hi Paul,	Mike Aucott-Pennington NJ	mlaucott@gmail.com	
9	Hi Paul, wonderful presentation. Any relationship of your measurements with degree of snow cover?	Mike Aucott-Pennington NJ	mlaucott@gmail.com	live answered
#	And could you also comment on question of whether trees "learn" or somehow outgrow vulnerability to cold?	Mike Aucott-Pennington NJ	mlaucott@gmail.com	live answered
#	<p>In so far as sensitivity to cold is believed to be the reason the northern range has historically ended in northern NE (e.g. VT), is it believed that climate change (warming) has shifted this map and has a model been used to redraw it?</p> <p>Second question- is there any reason or evidence to believe the addition of the OXO gene will cause transgenic trees to behave more like the warm, moderate or cold climate control group? Or hasn't this been tested or hypothesized?</p>	Evan Fox	efox407@gmail.com	live answered
#	As a molecular scientist I'm always curious about what is happening in the molecular genetic context of the organism. Do you have a feel for the epigenetic factors involved in cold tolerance and the freeze responses?	Meg Allen	megallenathome@gmail.com	live answered
#	Is there regional variation or a genetic basis for the retention of dead leaves in winter (like beech trees do)? It seems that individual chestnut trees are consistent year-to-year in losing leaves or retaining leaves. Those that retain leaves are susceptible to ice or heavy, wet snow damage here in Maine.	Mark McCollough	markmcollough25@gmail.com	live answered



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#	Any relationship to blight or fungi	Robert Gilman	gilmanbob@gmail.com	
#	Did you see freeze damage in the cambium of older shoots, expressed as dead regions on the stem, usually on the SW exposed stems? Here in Ohio, I've seen this kind of damage, esp on European chestnuts.	Greg	empirechestnut@gmail.com	live answered
#	What is the geographic provenance of seeds made available from TACF?	Donald Hulnick	dhulnick@gmail.com	Currently the material that comes from our Meadowview seed orchards are derived from the central part of the chestnut range. That provides a fair amount of adaptive plasticity for planting material throughout the eastern US. That said, more regional based seed orchards are coming online all over the chestnut range.
#	Have you run across anything that suggests that just before the blight hit, <i>C. dentata</i> was slowly continuing to move northward in response to the end of the Ice Age, ie continuing to acclimate, or is the end of the Northern Range also a function of other factors like more alkaline soil?	John Hempel	hempel@earthlink.net	live answered
#	Might the better performance of 200+ south sources be because we've seen a change in environment with climate change - i.e. what these trees from 200+ S. were adapted to is now what we see 200+ miles North?	Mike Aucott-Pennington NJ	mlaucott@gmail.com	live answered
#	I may have missed this but what is the minimum number of days it would take for chestnut to survive and set nuts?	Brad (aka rivercane)	bradfordj58@hotmail.com	
#	What differences are you seeing in male catkin formation between trees.	Anonymous Attendee		
#	Are you expecting the blight to kill the american chestnuts soon? If they were planted in 2009, they are now entering their 13th year.	ericmassant	eric.massant@gmail.com	live answered
#	Very nice presentation. Do you have any sense of whether these patterns change when Chestnut moves from juvenile to mature growth changes? Is the provenance test still growing?	Anita Klein	aklein@unh.edu	live answered



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#	Does winter damage and spring frost damage increase the odds of blight successfully attacking by providing entry points?	Brad (aka rivercane)	bradfordj58@hotmail.com	live answered
#	Are these trees blight free you are researching with?	Anonymous Attendee		No - there is a lot of blight in the planting now.
#	What is your thought about selecting heat tolerant Am chestnut along with blight trait from Chinese chestnut?	Nurul Faridi	chestnut101@gmail.com	
#	what would happen if the temperature would go down to 0 for 1 day	Russel Boyer	kellyboyer81@yahoo.com	live answered
#	How does cold affect the flowering of trees from southern provenances? We have trees from Georgia planted in NY and they have refused to flower despite being well past the normal stage of flowering for our other trees from colder climates.	Erik Carlson	ehcarlso@syr.edu	live answered
#	2 years ago, in central VA, we had a very late frost on Mothers Day. It fully froze all the pistalate and catkins on Dunstan hybrid, but did not effect full Chinese or Am ches that was noticeable. Some Dunstable pushed out scraggly secondary Calkins but no pistalate secondary. Any thoughts? Are your test trees of bearing age yet?	Dan Lefever	bioratpa@gmail.com	Hi Dan, I was here for that late frost. The answer is more about geographic variation in how bad trees were hit. We saw a lot of damage on Americans and hybrids in some orchards but not others. The damage was based on how far the leaf out was and site-specific cold temps. It affected all sorts of genotypes. BTW Dunstans are essentially Chinese chestnuts, so they may break bud earlier than Americans and hybrids.
#	Related to the elevation vs. latitude question, I recall a Park Ranger @ Shenandoah NP once saying that "Spring moves up the mountain about 100ft/day."	John Hempel	hempel@earthlink.net	Thanks John!



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#	<p>An additional geographic/climate factor to consider is maritime vs continental. We're quite aware of temperature differences throughout the year near the ocean. Since chestnut grows near the coast (at least until PRR becomes an issue in the south), might this be included?</p> <p>We notice moderated lows here plus later springs and later autumns near the coast here in RI, I suspect CT/ME/MD etc. also.</p>	Yvonne Federowicz	yvonne_federowicz@brown.edu	Hi Yvonne, Tom here...Paul didn't mention this, but this was definitely a factor we considered in determining the various climate zones. Indeed, some northern sources in ME (cosyal) and maybe one NY source near Lake Ontario were considered moderate zones because of those moderating factors.
#	<p>Thank you Paul. Really enjoyed the presentation! In regards to cold tolerance I am interested in the elevation variable (particularly growth at orchard site attempts at the higher end of eastern elevations say between 4,000 to 5,000 plus feet in elevation). Before the blight is there information related to how high in elevation the American chestnut thrived across it's range?</p>	Russell Paige	paigera@appstate.edu	
#	<p>American chestnut grows well in Florida 9b</p>	Anthony Chechile	achechile4496@gmail.com	
#	<p>I have 32 trees that are from an early ACF F3BC2 cross and younger trees F3BC3 crosses of my own that range from 35 ft tall 10+DBH to 4ft trees planted last fall that will help to answer the last question I live in watertown NY Zone 3 we frequently have temperature greater than 30 below zero F. my other questions have been answered</p>	walkerheapiii	walkeriii@aol.com	
#	<p>Don't laugh, hear me out on this. I have planted tree seedlings here for a long time and now I have 10 chestnut seeds in the ground. I have a lot of red cedars here and I noticed that there is nothing that disturbs red cedars including deer, rabbits, fungus etc so I place red cedar branches around everything I plant and everything leaves it alone. I even hang red cedar branches in young trees to keep the deer from scraping the bark. Would a plant like red cedar help keep away the blight if red cedar branches cut off were hung in the chestnuts and placed all around the ground. This question isn't about temps and I'm in Va. near the mountains.</p>	Lehman orv	coolmtnman@verizon.net	
#	<p>thanks everyone this was amazing!</p>	john mandalakas	john@mandalakas.com	