



Tree Improvement 101 Webinar Series- April 2024 Programs & References Referred to in the Webinar Series

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Tree Improvement 101 Webinar Series- April 2024

- Find all of the webinars in the series here:
 - <https://forestrywebinars.net/sponsor-pages/trees-101>

Programs related to Tree Improvement:

- American Chestnut Cooperators' Foundation:
 - <https://www.accf-online.org/accf1.htm>
- Emerald ash borer at Northern Research Station:
 - <https://www.fs.usda.gov/nrs/highlights/2020/512>
- Koa wilt resistance:
 - <https://cms.ctahr.hawaii.edu/forestry/Education-Outreach/Forestry-Pests-Diseases/Koa-Wilt>
- The American Chestnut Foundation:
 - <https://taf.org/>
- Beech bark disease at Northern Research Station:
 - <https://www.fs.usda.gov/research/news/highlights/finding-beech-bark-disease-resistant-american-beech-trees-its-genes>
- Dutch elm disease at Northern Research Station:
 - <https://www.fs.usda.gov/inside-fs/delivering-mission/sustain/forest-service-partners-work-restore-american-elm>
- Butternut canker:
 - <https://butternut.rngr.net/>
- Port-orford-cedar and white pine blister rust at Dorena:
 - <https://www.fs.usda.gov/detail/r6/landmanagement/resourcemanagement/?cid=stelpfdb5279775>
- Hemlock woolly adelgid:
 - <https://savehemlocksnc.org/hemlocks-hwa/hemlock-woolly-adelgid/>

References on Tree Improvement Referenced in the Tree Improvement 101 Webinar Series:

- Carey, D.W.; Mason, M.E.; Bloese, P.; Koch, J.L., 2013. **Hot callusing for propagation of American beech by grafting**. HortScience, 48(5), pp.620-624.
- Conklin, D.A.; Fairweather, M.L.; Ryerson, D.E.; Geils, B.W.; Vogler, D.R. 2009. **White pines, blister rust, and management in the Southwest**. USDA Forest Service, Southwestern Region, R3-FH-09-01. 16p.

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- Dudley, N.; Jones, T.; Gerber, K.; Ross-Davis, A.L.; Sniezko, R.A.; Cannon, P.; Dobbs, J. 2020. **Establishment of a Genetically Diverse, Disease-Resistant Acacia koa A. Gray Seed Orchard in Kokee, Kauai: Early Growth, Form, and Survival.** *Forests*. 11: 1276. <https://doi.org/10.3390/f11121276>
- Farjon, A. 2013. *Chamaecyparis lawsoniana*. The IUCN Red List of Threatened Species: e.T34004A2840024. <http://dx.doi.org/10.2305/IUCN.UK.2013-1.RLTS.T34004A2840024.en>
- Horns F.; Hood, M.E. 2012. **The evolution of disease resistance and tolerance in spatially structured populations.** *Ecol Evol* 2(7):1705–1711. doi:10.1002/ece3.290
- Johnson, J.S.; Sniezko, RA. 2021. **Quantitative Disease Resistance to White Pine Blister Rust at Southwestern White Pine's (*Pinus strobiformis*) Northern Range.** *Front. For. Glob. Change* 4:765871. doi: 10.3389/ffgc.2021.765871
- Kinloch, BB, Jr.; Sniezko RA; Dupper, GE. 2003. **Origin and distribution of Cr2, a gene for resistance to white pine blister rust in natural populations of western white pine.** *Phytopathology*. 93 (6): 691–694. <https://doi.org/10.1094/PHYTO.2003.93.6.691>
- Kinloch, BB, Jr; Sniezko, RA; Dupper GE. 2004. **Virulence gene distribution and dynamics of the white pine blister rust pathogen in western North America.** *Phytopathology*. 94(7):751–758
- King, J. N.; DeBell, J; Kegley, A.; Sniezko, R. A.; McDonald, G.; Ukrainetz, N. 2018. **Provenance variation in western white pine (*Pinus monticola*): The impact of white pine blister rust.** In: Schoettle, Anna W.; Sniezko, Richard A.; Kliejunas, John T., eds. *Proceedings of the IUFRO joint conference: Genetics of five-needle pines, rusts of forest trees, and Strobosphere*; 2014 June 15-20; Fort Collins, CO. Proc. RMRS-P-76. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. p. 63-80. <https://www.fs.usda.gov/treesearch/pubs/56699>
- Kinloch, B. B., Jr.; Sniezko, R. A.; Savin, D. P.; Danchok, R; Kegley, A; Burton, D; Dunlap, J. 2018. **Patterns of variation in blister rust resistance in sugar pine (*Pinus lambertiana*).** In: Schoettle, A.W.; Sniezko, R. A.; Kliejunas, J. T., eds. *Proceedings of the IUFRO joint conference: Genetics of five-needle pines, rusts of forest trees, and Strobosphere*; 2014 June 15-20; Fort Collins, CO. Proc. RMRS-P-76. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. p. 124-128. <https://www.fs.usda.gov/treesearch/pubs/56712>
- Koch, J. 2010. **Beech bark disease: the oldest “new” threat to American beech in the United States.** *Outlooks on Pest Management*. DOI: 10.1564/21apr03.
- Koch, J.; Carey, D.; Mason, M.; Poland, T.; Knight, K.S. 2015. **Intraspecific variation in *Fraxinus pennsylvanica* responses to emerald ash borer (*Agrilus planipennis*).** *New Forests*. 46:995–1011. DOI 10.1007/s11056-015-9494-4
- Martins, R.; Carlos, A.R.; Braza, F.; Thompson, J.A.; Bastos-Amador, P.; Ramos, S.; Soares, M.P. 2019. **Disease Tolerance as an Inherent Component of Immunity.** *Annu. Rev. Immunol.* 37:405–37

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Tree Improvement 101 Webinar Series- April 2024 Programs & References Referred to in the Webinar Series

- Merrick, L. F.; Burke, A.B.; Chen, X; Carter, A.H. 2021. **Breeding With Major and Minor Genes: Genomic Selection for Quantitative Disease Resistance.** *Frontiers in Plant Science.* 12: 713667 doi: 10.3389/fpls.2021.713667
- Miller, M.R.; White, A.; Boots, M. 2005. **The evolution of host resistance: Tolerance and control as distinct strategies.** *Journal of Theoretical Biology.* 236(2): 198-207. <https://doi.org/10.1016/j.jtbi.2005.03.005>.
- Pike, C.C.; Koch, J.; Nelson, C.D. 2020. **Breeding for Resistance to Tree Pests: Successes, Challenges, and a Guide to the Future.** *Journal of Forestry.* 1–10 doi:10.1093/jofore/fvaa049
- Pike, C.C.; Berrang, P.; Rogers, S.; David, A.; Sweeney, C.; Hendrickson, J. 2018. **Improving the resistance of eastern white pine to white pine blister rust disease.** *Forest Ecology and Management.* 423: 114-119.
- Rutkoski, 2019. In: *Advances in Agronomy.* Vol. 157. 217-219
- Sniezko, R. A.; Johnson, J. S.; Kegley, A.; Danchok, R. 2024. **Disease resistance in whitebark pine and potential for restoration of a threatened species.** *Plants, People, Planet,* 6(2), 341–361. <https://doi.org/10.1002/ppp3.10443>
- Sniezko, R.S.; Koch, J. 2017. **Breeding trees resistant to insects and diseases: putting theory into application.** *Biol Invasions.* 19:3377–3400.
- Zinck and Rajora. 2016. **Post-glacial phylogeography and evolution of a wide-ranging highly-exploited keystone forest tree, eastern white pine (*Pinus strobus*) in North America: single refugium, multiple routes.** *BMC Evolutionary Biology.* 16:56.

Video Presentations

- Genetic Resistance to Rapid 'Ōhi'a Death: A Hope for Survival, June 16, 2019
 - <https://www.youtube.com/watch?v=NS--jhMnPGs>
- Preserving Oregon's ash trees (article/embedded video)
 - <https://www.myoregon.gov/2022/04/15/preserving-oregons-ash-trees/>
- Finding and developing resistance in host trees at Myrtle Rust webinar (Sniezko)
 - <https://www.youtube.com/watch?v=XtxZz5ULaJQ>
- Link to myrtle rust webinar series:
 - <https://www.landcareresearch.co.nz/discover-our-research/biosecurity/ecosystem-resilience/beyond-myrtle-rust/webinar-series/>
- North American Forest Genetics Society 2022 Meeting (recorded presentations):
 - [\(2\) North American Forest Genetics Society - YouTube](#)
- Myrtle Rust Conference Presentations
 - Keynote address from Myrtle Rust conference:
 1. *Developing Disease Resistance Tree Populations for Restoration* (Sniezko)
 2. <https://www.youtube.com/watch?v=AfOQJeSe9Qo>
 - Strategies goals, and needs for resistance breeding and related ex situ conservation (Sniezko)
 1. <https://www.youtube.com/watch?v=gGAKvkG5Hy4>

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- High-elevation five-needled white pines: science and management webinar series (2023):
 - Finding and Using Genetic Resistance to White Pine Blister Rust in Five-Needle Pines.
 1. <https://www.youtube.com/watch?v=j8DTEEmHwY>
- The potential for biotechnology to address forest health. Presentations at National Academy of Science in 2017. (nas.edu/forestbiotech)
 - LINK: <https://vimeo.com/257925891>.
 1. Populus and Septoria diseases (0-30 min),
 - Jared Leboldus: and
 2. A breeding strategy to save green ash (30-60 min)
 - Jennifer Koch, USDA Forest Service:)
 - LINK: <https://vimeo.com/247049276>.
 1. Tree breeding for forest health – current successes and how biotechnology can help (0- 40 min),
 - a. Richard Sniekzo, USDA Forest Service
 2. Emerald ash borer- the complexities of a catastrophic invader (40 -1:20); Jared Westbrook, The American Chestnut Foundation – Restoration of American chestnut: a marriage of breeding and biotechnology (1:20-2:00),
 - a. Deb McCullough, Michigan State University.

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