(do not share, unpublished data, revised 8february2023, pjs)

**Seedling Height Data – slash wall harvests**

* Heights were measured on seedlings found at established sample points throughout the slash wall harvests. The data set represents approximately 10,000 stems among almost a dozen species
* The year the growth occurred was converted into “growing season years” to allow comparison among harvests that occurred at different times.
* Stems were selected to include common and desired commercial species and species known for interference (beech (be) and eastern hophornbeam (eh))
* To assess the likelihood of success and competitive positioning, stems were selected if they were free to grow and of average or above average height within the plot
* Caveats from Mike:
* Did you say not to sample any evergreens?  I agree there were only a couple *Larix* and I do not think I have measured any this past year.  However, from what I remember of sampling *P. strobus* and *Picea* ssp. I would say there are more samples of them inside and outside then there are of beech singles/unknown.
* FYI, I won’t be able to measure the tallest in years to come because many will be out of reach.  It is very hard to measure over 144” because it is hard to see if the tape measure is at the top and it gets hard to read the numbers on the tape.
* I think some of this we discussed but I thought I should re-state it in case we did not. You don’t want to hear this but some of the might be because seedling height measurement selection criteria changed in 2022 from previous years.  I the first years I tried to measure the desirable seedlings within in the 3 and 6’ measurement circles.  In 2022 the gas line and the red pine harvest had so many desirable stems the sphere of focus expanded to include more of the 26’ radius circles.  That being said, many beech sprouts/suckers took off with much more height growth over the last year or so. Sugar maple seedlings also seemed to need a couple of years to put down roots and start to take off.  Red maple seemed to have more height growth than  sugar maple early on but they also put on much more height growth after getting closer to the same height as the forbs around it.  Another thing you changed this last year was to allow the use of stems that might have been observed as coppice growth the first couple of years but had grown enough diameter so as to not be able to tell if it had been started from a cut seedling.
* Keep in mind when analyzing this data that there is a lot of randomness still in what seedlings are measured from year to year.  I measured the tallest  I saw first each time and if I do not look one way or the other I could miss taller examples I might have measured in years prior or vice versa.

Figure\_z1 : seedling heights by species and growing seasons

* All harvests are lumped together, and as of 8february 2023, some sites have not been completely sampled. These sites represent a small proportion of the data points.
* American beech (ab) lumps origins = sprout and single/unk
* American beech (ab) has the fastest growth rate, equal to eastern hophornbeam (eh), although beech seems uninfluenced by the protection of slash walls.
* Red maple (rm), red oak (ro), sweet birch (sb), sugar maple (sm) and white ash (wa) have better growth with protection from slash walls versus in control, unprotected areas.
* After five growing seasons, beech and hophornbeam have the tallest stems, although data on sweet birch was discontinued after three growing seasons due to height.
* The growth inflection of sweet birch (see discussion of figure z3) may have been evident in the field in the 4th growing season where heights may have precluded accurate and effective measurements.
* The slower growth of sugar maple and red maple might reflect the suppression of these seedlings in the boot and wedge harvest by pin cherry and elderberry. Also, these data include Decker and the browsing of seedlings.
* The faster growth rate of beech and hophornbeam might result from their existence prior to the harvest given their low palatability.
* Growing season three is basically 2020, which was a drought year. Note the lesser growth outside than inside the slash walls in growing season 2, but recovery in GS 4 and 5.

Chart

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Figure z2 – Annual Heights of Beech Seedlings

* Data from 2018 and 2019 (growing seasons 1 and 2) reflected taller initial heights of singl/unk beech stems as compared to those of known vegetative origin.
* The taller initial heights of single/unk origin beech stems (approx. 37” vs. 10”) likely reflects the release of advance regeneration that was clipped or not in the harvest but released from overhead competition. The sprout origin beech stems were by definition clipped and took time to recover.
* In subsequent growing seasons, beech stems of sprout origin accelerate growth rate as compared to single/unk.
* The average annual height increase of beech sprout origin stems is approximately 15 inches
* The average annual height increase of single/unk origin stems is approximately 7 to 10 inches, with lesser annual height increase within the walls.
* Of the single/unk origin beech stems, there is an apparent stabilizing of height after three growing seasons inside slash walls. The cause of this is unknown, but might result from competition with sprout origin beech stems, fewer root reserves, and/or competition with associated vegetation (e.g., Rubus, pin cherry, paper birch).

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Figure z3 – seedlings heights in walls that are effective and harvests without excessive interfering vegetation.

* This figure shows data that exclude: decker, circle and station road harvests
* The slope of the lines, which reflects grow rate, is more similar among species than in figure z1
* Red maple, red oak, sugar maple and white ash all show an inflection of growth between the 4th and 5th growing season.
* heights of desirable hardwood species inside the walls are similar to the heights of interfering species (beech, hophornbeam) after 5 growing seasons.

Chart

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