LARCH VIRTUAL EXPERIMENT STATION RESEARCH NOTE #8

Measuring Young Larch Plantations in Upper Androscoggin Watershed

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This winter, Dan Simonds of Mixedwood, contacted the Larch Virtual Experiment Station regarding his experience with exotic larches when he served as silviculturalist with MeadWestvaco in the early 2000's. MeadWestvaco was investigating management options for high quality sites. One option was to regenerate these sites to fast-growing exotic larch. Roughly 1,000 acres was planted on lands in western Maine and northern New Hampshire in the upper Androscoggin Watershed.

Two seed sources were used, both from Carl Haag, then at S. D. Warren. One source was hybrid larch from the Unity Seed Orchard, and the other was from the German von Lochow open-pollinated seed orchard (Langner, et al, 1998). The latter was called "European" larch. The seedlings were grown at the Northern Forest Nursery in Nova Scotia and were either 1-0 bare-root or in jiffy pots.

The sites were clear-cut. Because the sites were of high-quality and would regenerate naturally to sugar maple and other hardwoods, a hot site preparation herbicide treatment was applied. The typical treatment was glyphosate with "hot" surfactant with additions of Sulfometuron Methyl (Oust) applied in July in the year before planting.

Stocking and survival was a great concern. Planting stocking was at between 700 -800 trees per acre. There were bucket mixtures of white spruce or sometimes Norway spruce planted along with the exotic larch.

On 22 July 2016, Dan and Dave Maass visited three standing plantations in Lynchtown and Parmachenee townships in western Maine. In each plantation, two variable radius plots were taken with a 20 BAF prism. All selected trees were measured for diameter at breast height to 0.1" and heights were estimated using a clinometer. Heights were taken as percent of the distance from the tree to the point where both the top and bottom of the tree were visible.

We also visited a recently harvested 13-year old plantation in Lynchtown. Pictures are taken, but no data was collected.

Data from the three measured plantations are presented in Table 1. Volumes were calculated using the Kozak taper equations from an Excel macro provided by Aaron Weiskittel with parameters for tamarack (See Li et al. 2012). The taper equations calculate total volume from the ground to the top of the tree. The macro calculates volume in cubic meters, which is converted to cubic feet at 35.3147 ft^3/m^3. Merchantable volumes can be estimated by setting parameters within the macro for stump height and upper diameter limit. In this case, we used stump height set at .15 meters (6") and a top diameter of 9 cm (3.5").

The maximum diameter measured was 11.2" on the Carrier Door plantation. It appears that on the best sites after 14 years, some trees are reaching small sawlog size.

One site had been clear-cut the previous spring. Here is the note from Sam Spaulding at Wagner Forest Management regarding that particular harvest.

> Dan,
> >
> > Just went through my mapping and records for the Greentop larch plantation. 1,091 tons of treelength pulp was harvested and delivered in June to the Farmington chip plant. The area of larch harvested was 27.6 acres and 34 1/2 loads were shipped. Four or five loads of biomass from the tops were also shipped from this area for an additional 140-160 tons. More biomass would have been possible from the limbs if a grinder was available, however, our contractor working this area has just a chipper. At the time, we were being strictly monitored for the minimum top diameter of 4 inches on pulpwood, so little undersized volume slipped through in the pulpwood.
> >
> > Scouting this block in May, I randomly measured DBH through the stand. As memory serves me, I measured approximately 30 trees that averaged 7.1 inches, varying from 4 inches to 10.5 inches.
> >
> > It was nice to catch up and talk about our many changes in the past 13 years. Let's hope we can get together sooner for the next chat!

It is not clear which of the two hybrids was planted on any of these sites. Digital planting records from the current land manager differ from collective memory of those involved.

Also, we don't know the initial stocking, but believe it to be 700 trees per acre. The plantations on the Carrier Door site and Lynchtown site have roughly 55% survival rate and, based on field observations, fully occupy the site.

Tree heights and volume seem to be related to site quality. It is likely that the two plantations in Parmachenee were planted with the same stock at the same time. Yet there are large differences in diameter, height and volume.

Table 1. Basic statistics of the stands.

Town	Site	Age	TPA	BA (ft^2/ac)	QMD (in.)	Height (ft)	Total volume (ft^3/ac)	Total MAI	Merch Larch volume (ft^3/ac)	Merch MAI
Lynchtown	Green Top -2	15	394	120	7.6	49	2925	195	2780	185
Parmachenee	Carrier Door	14	380	110	7.9	44	2313	165	2201	157
Parmachenee	Carrier Door - 2	14	568	90	5.5	30	1278	91	1232	88

Table 2: Soil characteristics of the two Parmachenee sites.

Site	Soil Series		Parent Material	Structure	Drainage	Depth
Carrier Door	TEC					
	Telos	40%	Lodgement loamy till	Loam	Somewhat poorly-drained	15”-30” to densic material
	Chesunkook	25%	Coarse loamy till	Gravelly silt loam	Moderately well-drained	21”-31” to densic material
	Elliotsville	20%	Coarse loamy subglacial till	Channery loam	Well-drained	21”-43” to bedrock
Carrier Door -2	EMD					
	Elliotsville	45%	Coarse loamy subglacial till	Channery loam	Well-drained	21”-43” to bedrock
	Monson	40%	Loamy subglatial till	Loam – Channery loam	Somewhat Excessively Drained	11” – 25” to lithic bedrock

Table 3: Soil Characteristics of the Lynchtown site.

Site	Soil Series		Parent Material	Structure	Drainage	Depth
Lynchtown	MVC					
	Monson	30%	Loamy subglatial till	Loam – Channery loam	Somewhat Excessively Drained	11” – 25” to lithic bedrock
	Elliotsville	30%	Coarse loamy subglacial till	Channery loam	Well-drained	21”-43” to bedrock
	Knob Lock	20%	Organic material over loamy subglatial till	Loam	Excessively drained	2”-20” to lithic bedrock

Literature Cited:

Langner, W and V. Shneck: Ein Beitrag Zur Zuchtung von Hybridlarchen (*Larix x europletis* Henry). Das Langzeitprogram der Firma von Lochhow-Petkus. [Contribution to the breeding of hybrid larch(*Larix x eurolepis* Henry). Long-term programme of the von Lowchow-Petkus company]. J. D. Saulanders Verlag. Frankfurt am Main. 1990. 159 pp. ISBN3-7939-0850-X, price 26 DEM.

Li, Rongxia, Aaron Weiskittel, Adam R. Dick, John R. Kershaw Jr., and Robert S. Seymour. 2012. Regional Stem Taper Equations for Eleven Conifer Species in the Acadian Region of North America: Development and Assessment. North J. of Applied Forestry 29(1):5-14.

Dan Simonds in 14 –year old hybrid larch plantation in Parmachenee Twp, Maine, 22 July 2016.

Dan Simonds in 14 –year old hybrid larch plantation in Parmachenee Twp, Maine, 22 July 2016.

Dan Simonds in 14-year old plantation in Parmachenee Twp, Maine, 22 July 2016, holding white spruce planted at the same time as the hybrid larch and a volunteer white birch of the same age.

15-year old hybrid larch plantation in Lynchtown Twp, Maine, 22 July 2016.

Dan Simonds measuring heights on 15-year old hybrid larch plantation 22 July 2016 in Lynchtown Twp, Maine.

13-year old hybrid larch plantation harvested in Lynchtown Twp, Maine 22 July 2016. Note the size of the stumps.

Stump from harvested 13-year old hybrid larch plantation, Lynchtown Twp, Maine 22 July 2016. The D-tape is 3” in diameter.