Slash Walls: Effective Limitation to Deer Impacts on Hardwood Regeneration

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USDA United States Department of Agriculture
National Institute of Food and Agriculture

New York's Forests

"…New York's forests are changing, and, without intervention on many fronts, will change our forests and the amenities and benefits they provide in profound ways." (p. 8 NYS DEC FRAS summary report)

Foresters Suggest a Problem Looms

	Statewide	Adirondacks	Southern Highlands	Other
Highly Successful	13	12	16	8
Moderately Successful	17	31	13	16
Marginally Successful	45	50	47	38
Complete Failure	25	7	24	38

Connelly, NA, PJ Smallidge, GR Goff and PD Curtis. 2010. Foresters perception of forest regeneration and possible barriers to regeneration in New York State. Cornell University Department of Natural Resources Human Dimensions Research Unit HDRU 10-2. 37 pp.
http://www2.dnr.cornell.edu/hdru/pubs/HDRUReport10-2.pdf

Permanent Plots Suggest A Potential Problem

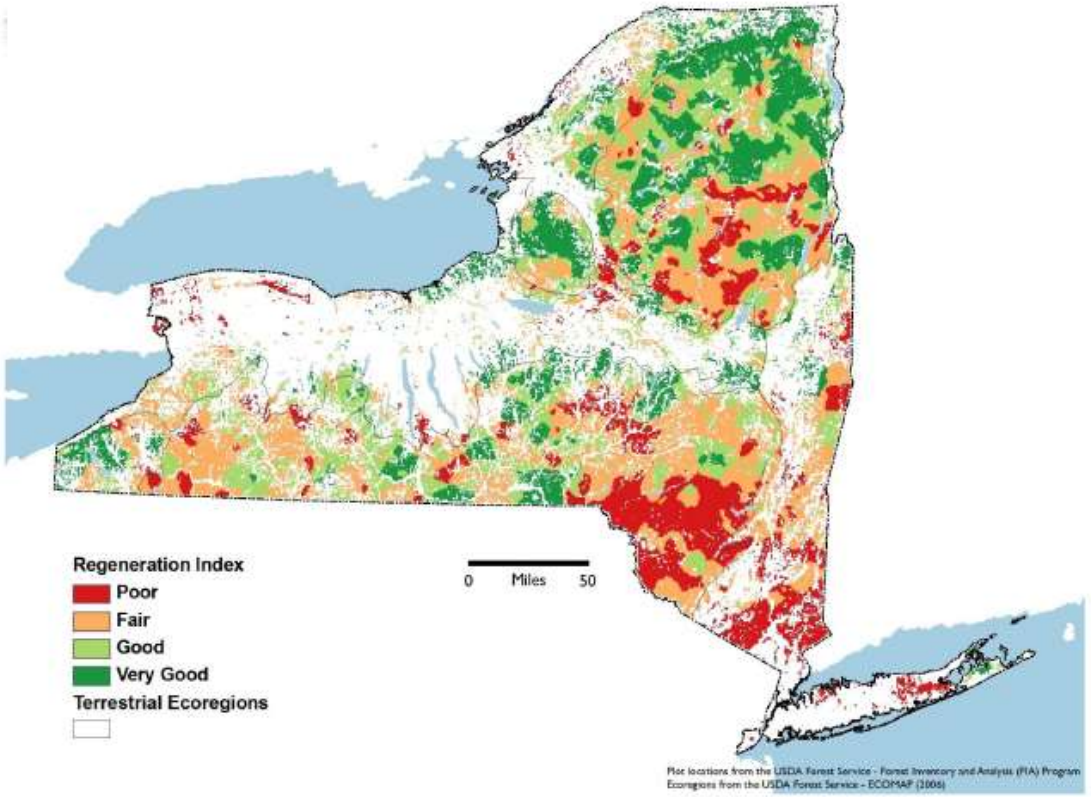


Figure 6. Predicted values for Regeneration Index of desirable timber species in New York State.

Shirer, R and C Zimmerman. 2010. Forest regeneration in New York State. The Nature Conservancy. 25 pp. http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/newyork/placesweprotect/easternnewyork/final_nys_regen_091410_2.pdf

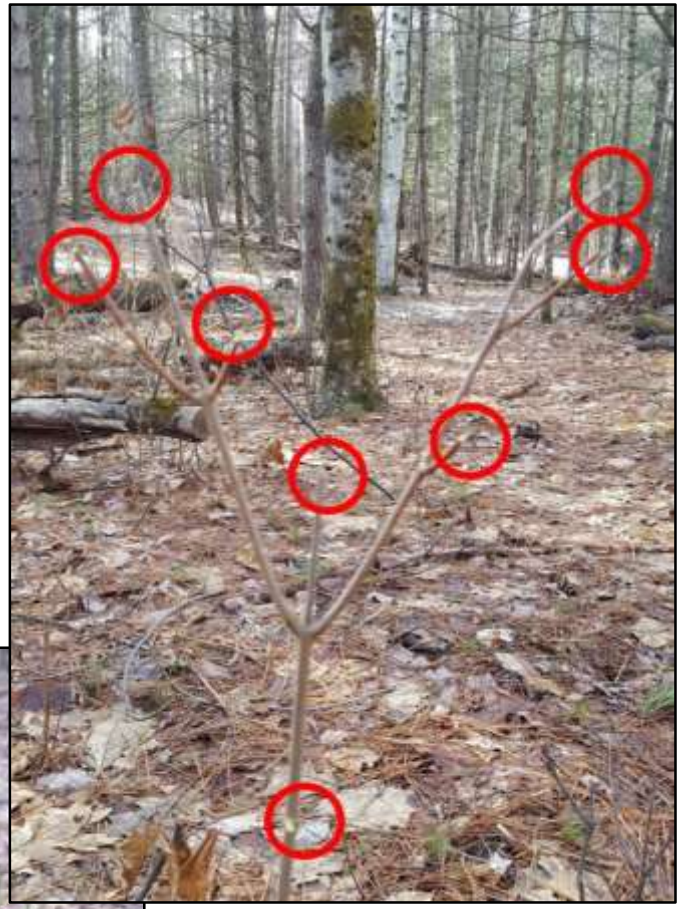
Factors Present (%) in Stands with Marginal or Failed Regeneration

	Statewide	Adirondacks	So. Highlands	Other
Deer	65	38	59	91
Interfering Vegetation	47	47	46	49
Owner Attitude	25	16	25	32
Owner Finances	21	18	29	12
Soil/Site	14	18	9	17
Forest Health	10	12	8	11

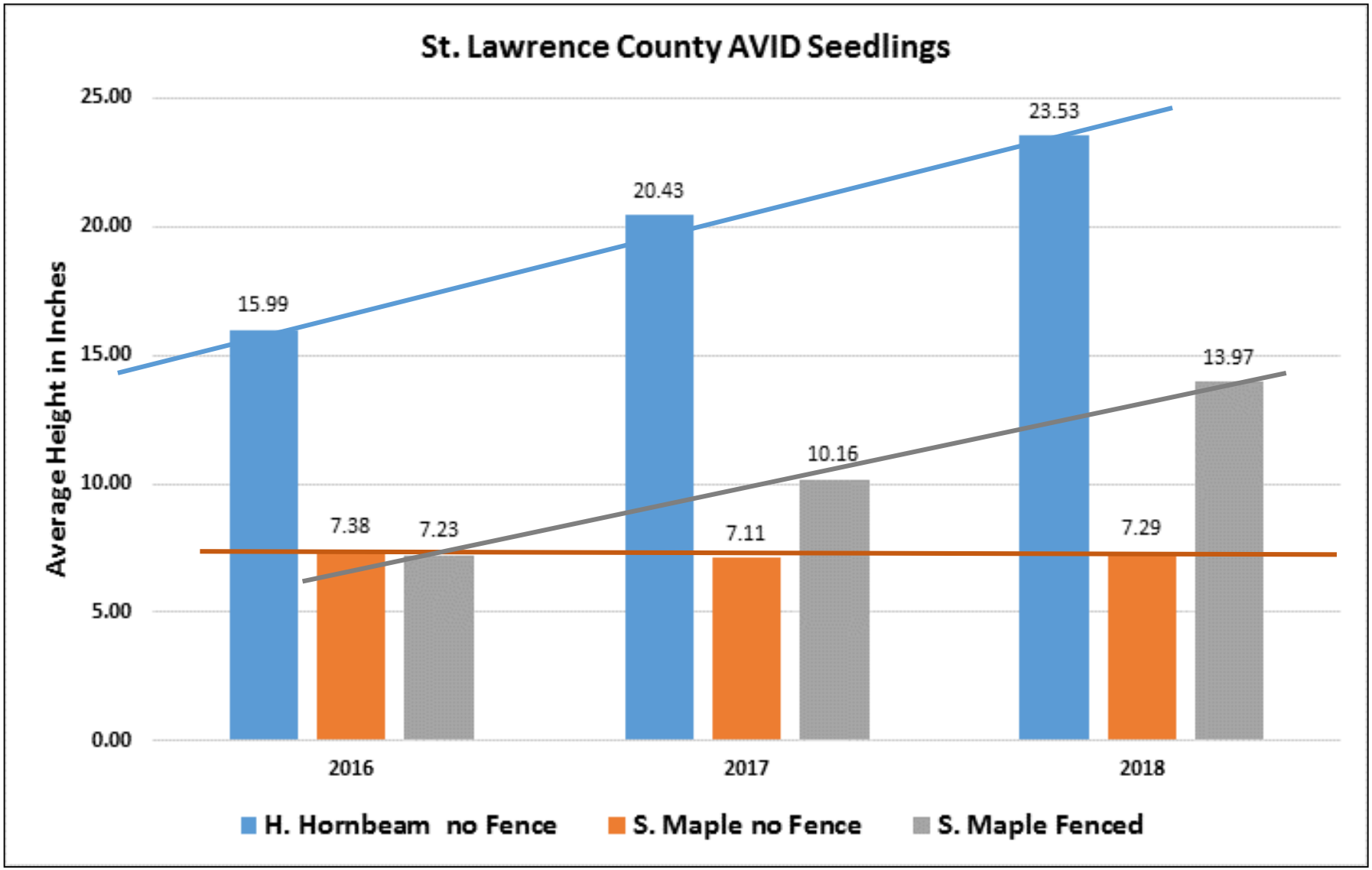
Connelly, NA, PJ Smallidge, GR Goff and PD Curtis. 2010. Foresters perception of forest regeneration and possible barriers to regeneration in New York State. Cornell University Department of Natural Resources Human Dimensions Research Unit HDRU 10-2. 37 pp. http://www2.dnr.cornell.edu/hdru/pubs/HDRUReport10-2.pdf

Deer browsing impacts

- ~7 lbs fresh weight per day
- 600 seedling tips per pound
- Up to 4200 seedlings per deer per day



Palatable, Non-palatable, and Fenced Seedlings



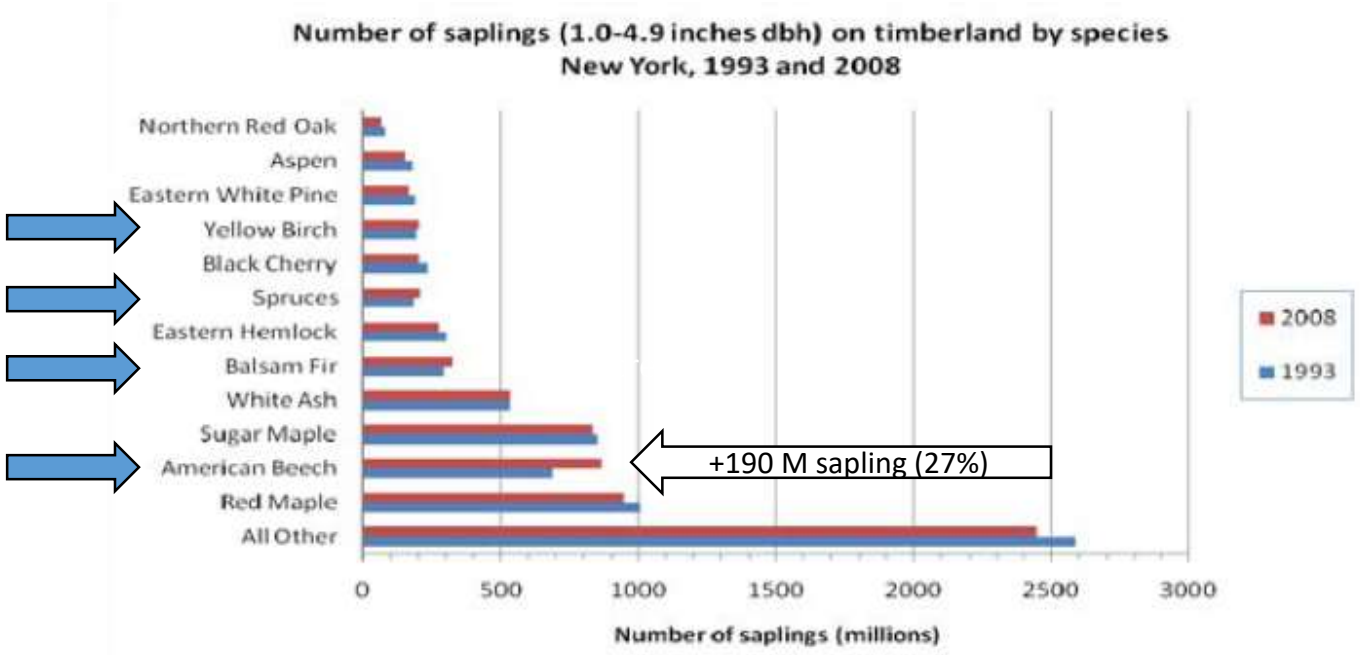
Data and slide courtesy of Mike Ashdown 7/28/2018

Deer Exclosure (8 deer / sq. mi)

Paul Curtis, 9/2014. ALC

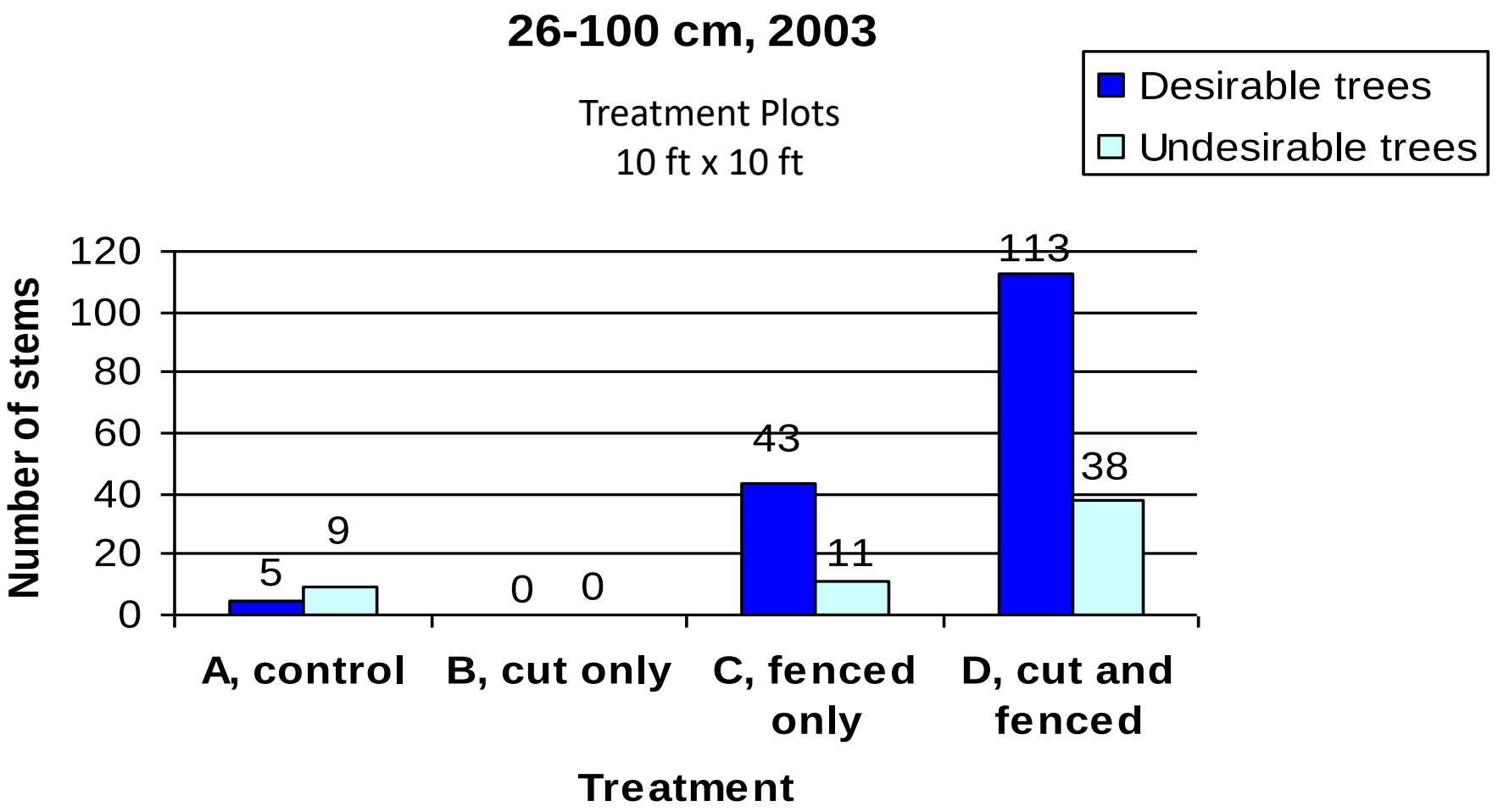
- Minimal Deer Impacts
- Overwhelm the Population

Few Species are Showing Recruitment



- Adapted from p. 42 of http://www.dec.ny.gov/docs/lands_forests_pdf/fras070110.pdf
- See also Shirer and Zimmerman, Table 4, page 13. Beech is most abundant regen spp.

Effects of Deer + Shade



Kamprath, K., Curtis, P., and Goff, G. 2003. Summer Intern project. Unpublished data.

Strip clearcut Arnot April 2006 (cut in May 2005). 100 ft wide

Arnot Forest, strip clearcut, June 10, 2016

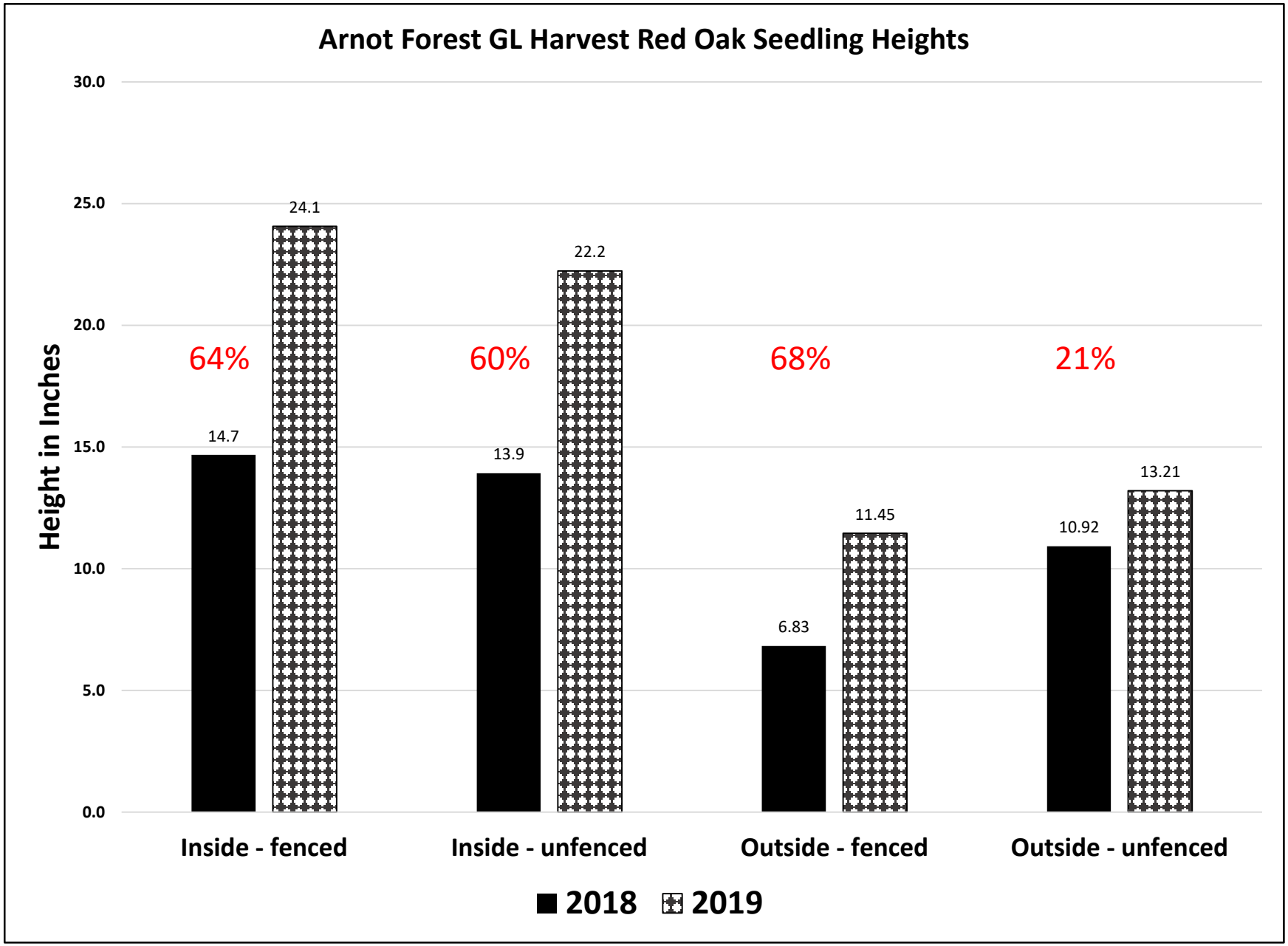
Arnot Forest, strip clearcut, January 2019

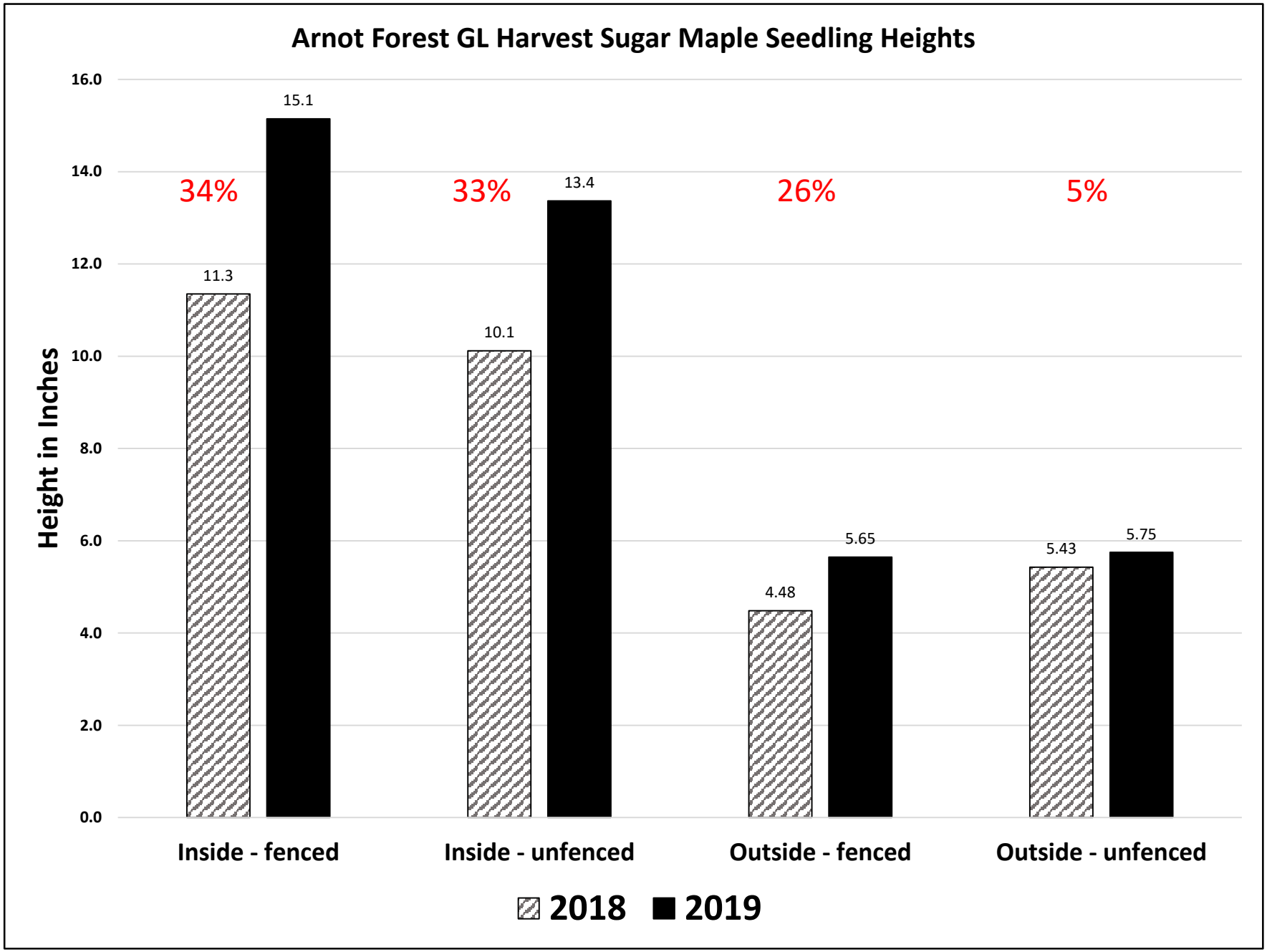
Seed Tree Harvest

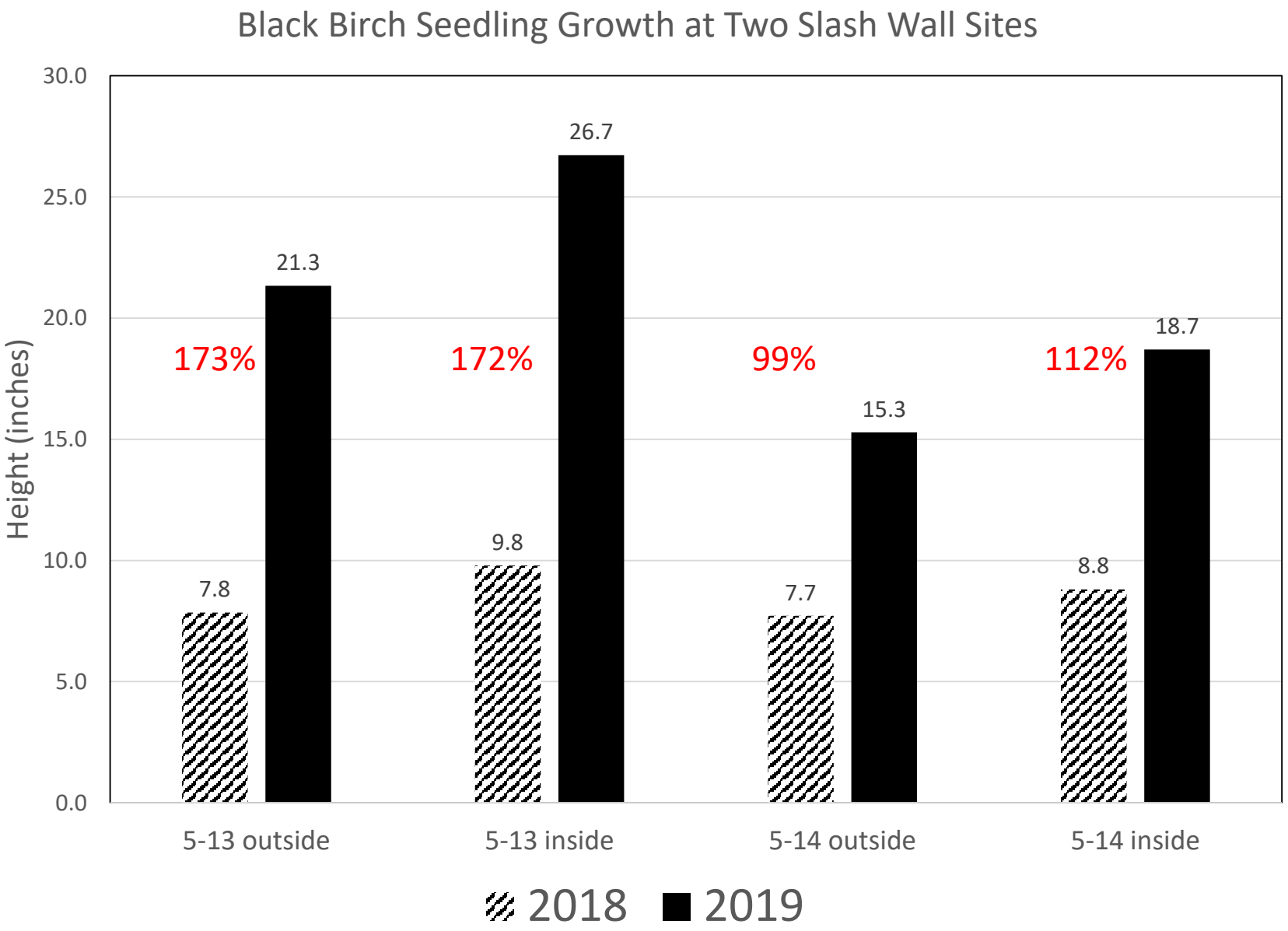
Shelterwood Harvest

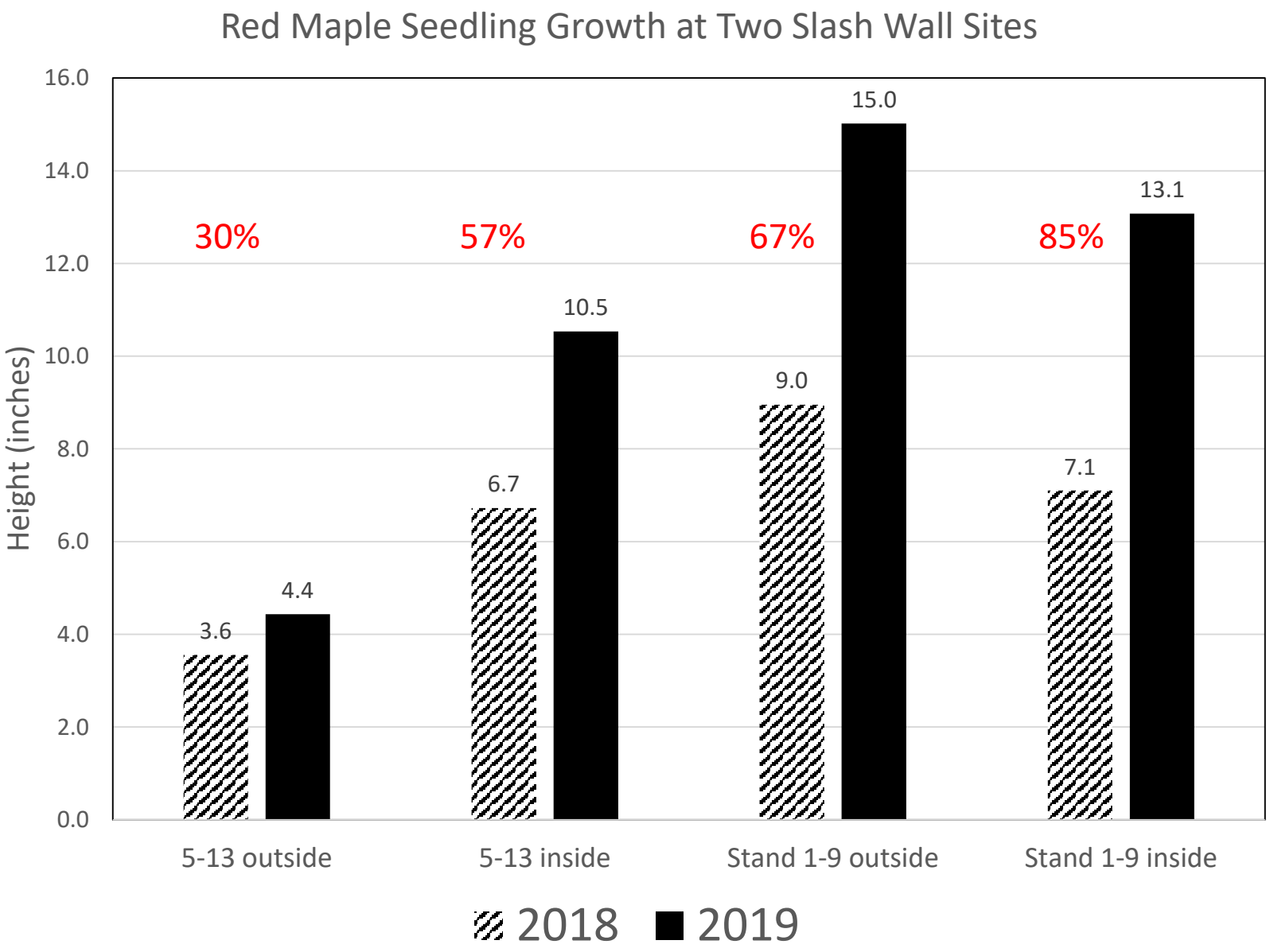
Slash Walls

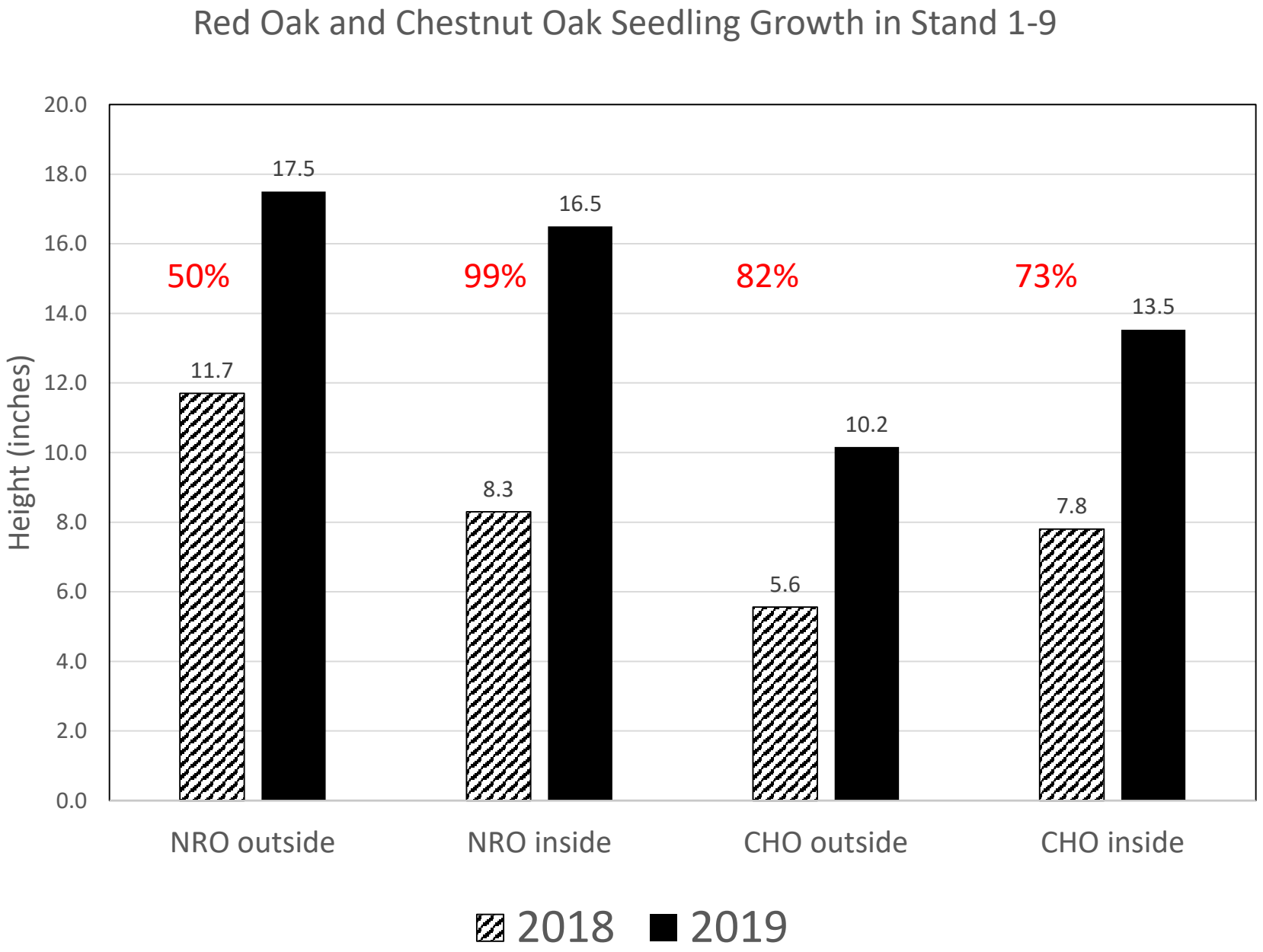
74 acres. “Gas Line” harvest completed 6/2017


Arnot Forest GL Harvest Red Oak Seedling Heights
Height in Inches
30.0
25.0
20.0
15.0
10.0
5.0
0.0
24.1
22.2
14.7
13.9
11.45
6.83
13.21
10.92
64%
60%
68%
21%
Inside - fenced
Inside - unfenced
Outside - fenced
Outside - unfenced
2018
2019


Arnot Forest GL Harvest Sugar Maple Seedling Heights
Height in Inches
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
34%
33%
26%
5%
11.3
15.1
10.1
13.4
4.48
5.65
5.43
5.75
Inside - fenced
Inside - unfenced
Outside - fenced
Outside - unfenced
2018
2019


Black Birch Seedling Growth at Two Slash Wall Sites
Height (inches)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
7.8
21.3
173%
9.8
26.7
172%
7.7
15.3
99%
8.8
18.7
112%
5-13 outside
5-13 inside
5-14 outside
5-14 inside
2018
2019


Red Maple Seedling Growth at Two Slash Wall Sites
Height (inches)
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
30%
57%
67%
85%
3.6
4.4
6.7
10.5
9.0
15.0
7.1
13.1
5-13 outside
5-13 inside
Stand 1-9 outside
Stand 1-9 inside
2018
2019


Red Oak and Chestnut Oak Seedling Growth in Stand 1-9
Height (inches)
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
17.5
16.5
50%
99%
82%
73%
13.5
11.7
10.2
8.3
7.8
5.6
NRO outside
NRO inside
CHO outside
CHO inside
2018
2019

Slash Walls

- At least 10 ft x 10 ft
- AVG 10 ft x 23 ft
- 16,000 feet on 4 completed harvests
- 2 harvests in progress

2017 Wall Labor & Machine Costs

Sale	Acres	Perimeter (ft)	Machine Hours	$ / Ft
01 – Gas Line	74	7400	62	$1.68
02 – Red Pine	11	2800	14	$1.00
03 – Sta. Rd.	16	3800	15	$0.80
04 - Wedge	12	2700	25	$1.88

2019 – Volume and Time In Walls

(volume as tons estimated per 100 feet of wall)

Stand Type	Total (tons)	> 6" Hdwd (tons)	> 6" Conifer (tons)	Feet / minute
Hdwd Pole	27	15	0	2.4
HEM-Hdwd Small-SWT	33	13	10	2.6
Old-field Pole	29	4	16	2.6
Overall AVG	31	12	9	2.6

Wood value approximately $0.75/ foot; **Estimated wall cost $2.25/ft**

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Photo by RJ Andersen, CCE Media