

Some Insights on Reforestation Methods

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Outline:

Research Topics:

- bird nets
- stone mulch
- invasives in shelters
- shelter types
- mowing frequency
- reforesting legacy sediments

Case Studies:

- tree shelter removal
- protecting multi-stem shrubs
- beating multiflora rose
- beating reed canary grass

Center-Hole Net Method

- Nets protect birds
- If neglected, tassel method tangles growing tree tips

Center-hole
Method



Photos: Matt Gisondi

Tassel
Method



Center-Hole Net Method

Center-hole method:

- 75% less tangling even if neglected

Center-hole
Method



Undamaged despite net still on

Tassel
Method



damage from tangling in net



Alternatives to herbicide for protecting trees from voles

Left: typical herbicide:

3'diameter spot
Rodeo™
(glyphosate)

2018: began second generation trials



36" herbicide spot



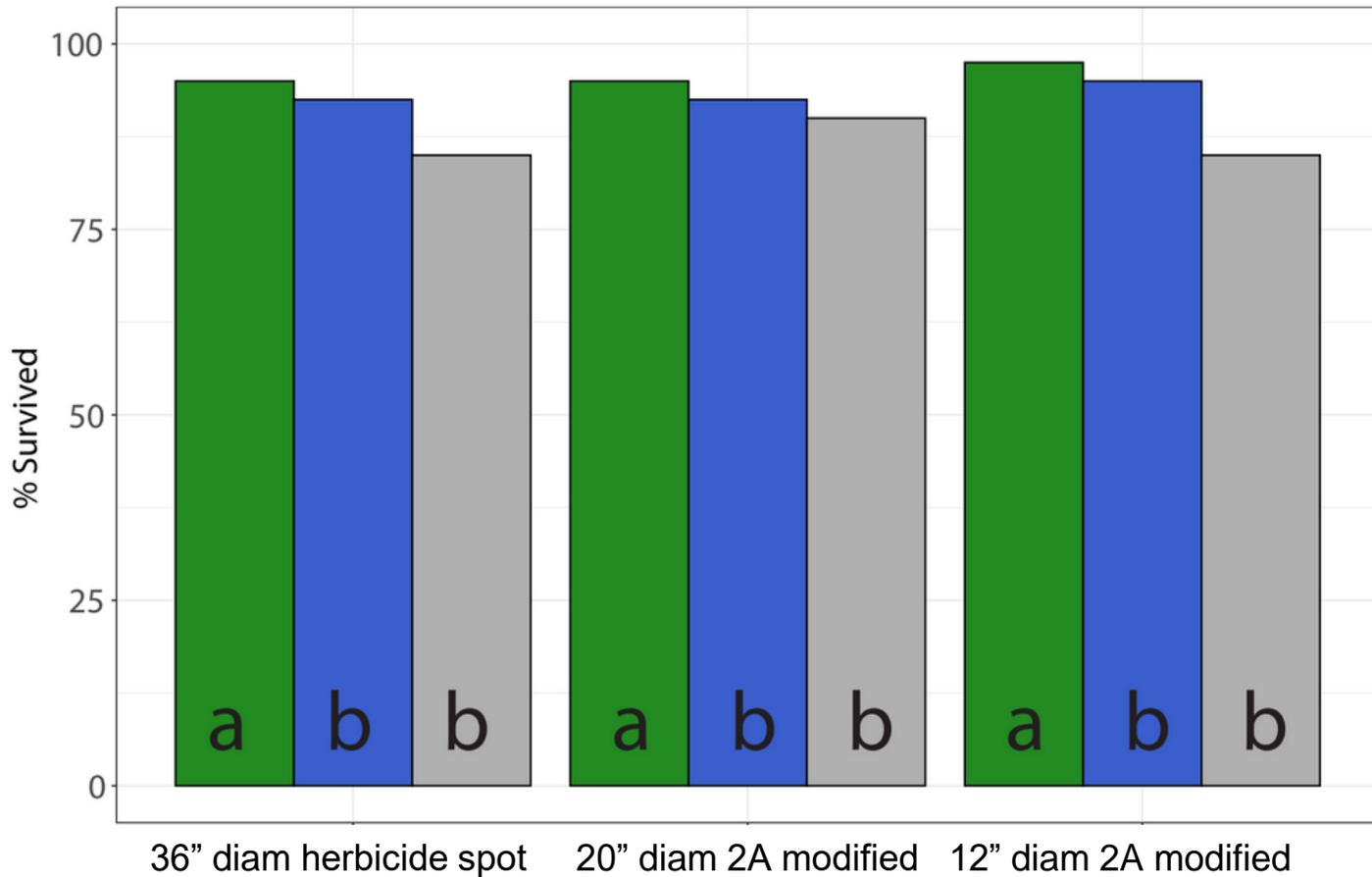
20x2" 2A-modified



12x2" 2A-modified



Stroud Preserve: SURVIVAL

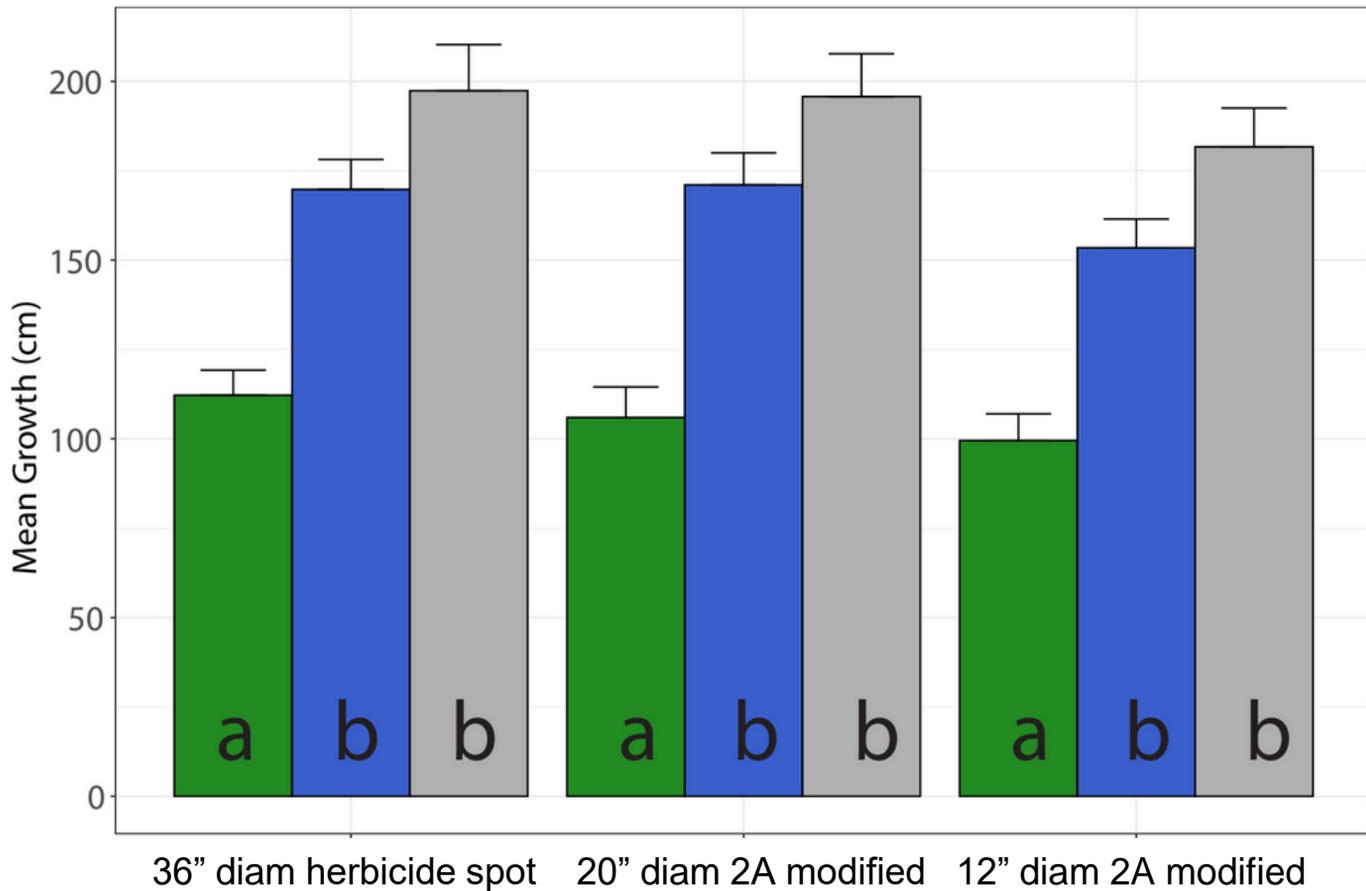


Year: sign. difference

Treatment: ns

■ Year 1 ■ Year 2 ■ Year 3

Stroud Preserve: GROWTH



Year: sign. difference

Treatment: ns

■ Year 1 ■ Year 2 ■ Year 3

Costs of Stone Mulch vs. Herbicide Spots

36" Herbicide Spot:

~\$7.70/tree
for 2x/yr x 4 yrs

8 mobilizations

No protection yrs 5-8



15" Stone Mulch:

~\$2.80/tree

done 1x only

Present in years 5-8





Using Pre-Emergence Herbicide INSIDE Tubes

Issue: invasives in tubes

- Birds defecate seeds into tubes
- Invasives compete with trees



Using Pre-Emergence Herbicide INSIDE Tubes

Tests of Snapshot™ INSIDE tree tubes

- prevents **germination** of seeds
- Apply before seed germination
- easy task via custom shaker below



Photo: Calen Wylie

Specimen Label

 Dow AgroSciences

Snapshot® 2.5 TG

Specialty Herbicide

®Trademark of Dow AgroSciences LLC

A selective preemergence herbicide for control of certain broadleaf weeds and annual grasses in:

- Landscape Ornamentals
- Christmas Tree Plantations
- Container Grown Ornamentals
- Field Grown Ornamentals
- Groundcovers/Perennials
- Non-Bearing Fruit and Nut Trees
- Non-Bearing Vineyards
- Non-Cropland

Active Ingredients:

trifluralin: α,α,α -trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine.....	2.0%
isoxaben: N-[3-(1-ethyl-1-methylpropyl)-5-isoxazolyl]-2,6-dimethoxybenzamide and isomers.....	0.5%
Other Ingredients.....	97.5%
Total.....	100.0%

Contains 1.25 lb active ingredient per 50 lb bag.

EPA Reg. No. 62719-175

Conclusions:

Oriental bittersweet in tube



Two applications per year -> no weeds thru August

Appears safe for trees



Testing Four Shelter Types:

Tubex
Combitube
(vented)



Suregreen
(vented)



Plantra
(vented)



Standard
Tubex
(not vented)





Too rapid top growth: only an issue regionally?

Conclusions:

- no significant differences thru 3 years in our locations for survival, height growth or stem caliper
- new tests added Suregreen™ tube – no differences thru 2 yrs
- so...choose tubes based on other aspects:
 - price! (subject to change)
 - ease of installation, seating into soil
 - fiberglass stake of Plantra – role vs. flopping syndrome??

Trials of Differing Mowing Frequencies

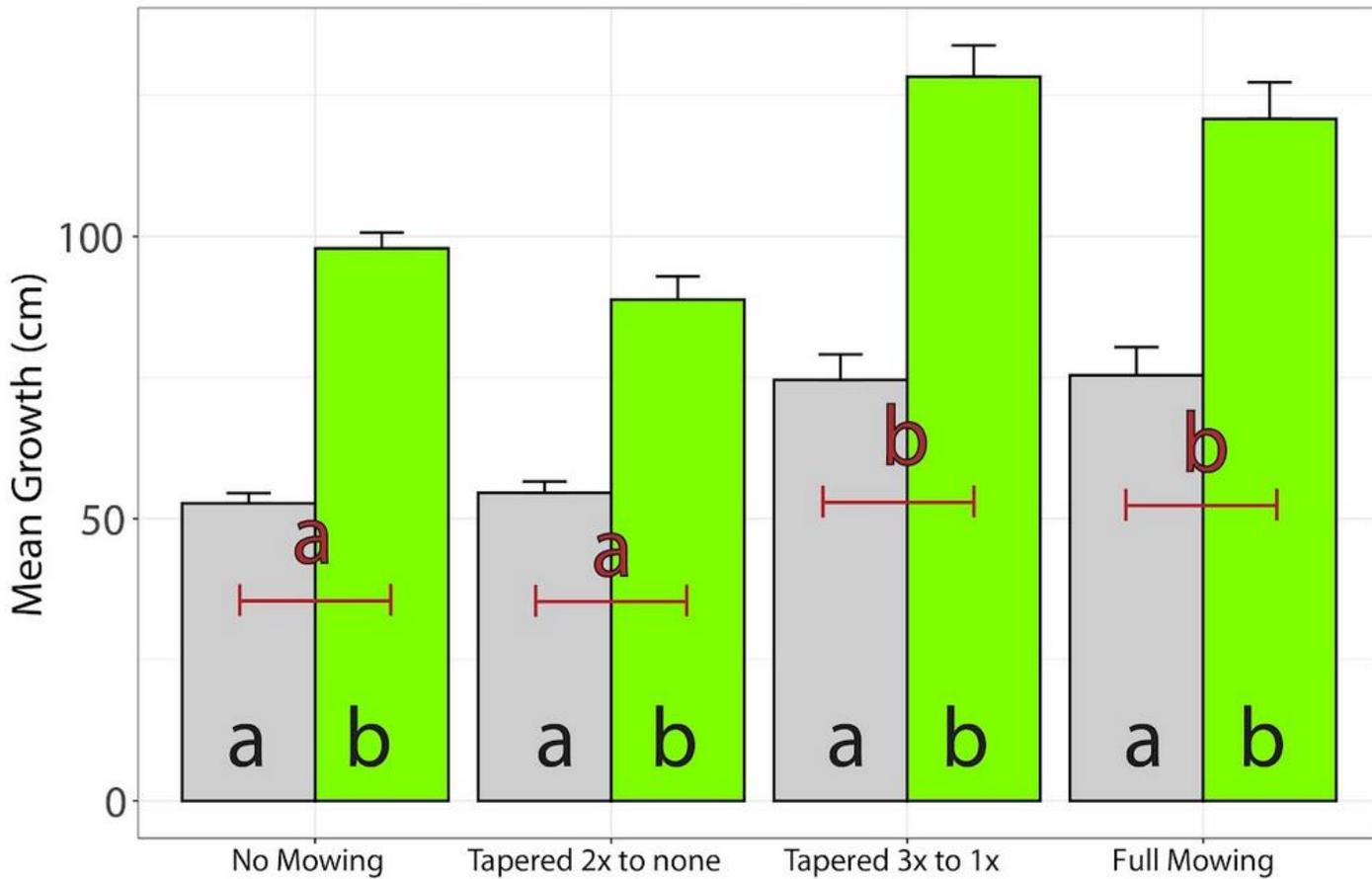
- mowing is a major cost
- helps manage competition, voles, invasives
- use of stone mulch creates option to reduce mowing

Impact of Differing Mowing Regimens

Regimen:	No Mow	Quick Taper	Slow Taper	Full Mowing
Year 1:	none	2x in year 1	3x in year 1	3x every year
Year 2:	none	1x	2x	3x
Year 3:	none	none	1x	3x
Year 4:	none	none	none	3x



Welling: Growth for Mowing Treatment



Year: sign. difference

Treatment: sign. difference

Year 1 Year 2

Can buffers succeed on legacy sediments?



[Forest restoration on floodplains mantled with legacy sediments: removing sediments appears unnecessary for successful restoration](#)

Sweeney, B.W., A. Dunbar, C.L. Dow, and M.D. Daniels. 2019. Restoration Ecology 27(6): 1220-1230.

Can buffers succeed on legacy sediments?

- Formal study: “yes”
- Dozens of non-study sites: “yes”
- Deep, rich soils are aids, not barriers
- Sites with legacy sediments removed will be more challenging (wetness)

Photo: 5 year old tree on legacy sediment



Case Studies:

- tree shelter removal
- protecting multi-stem shrubs
- beating multiflora rose
- beating reed canary grass

Case Study on Tree Shelter Removal: Actions when Trees Reached 1.5"-2" Diameter at Top of Tube

Full Removal



Split Full Length

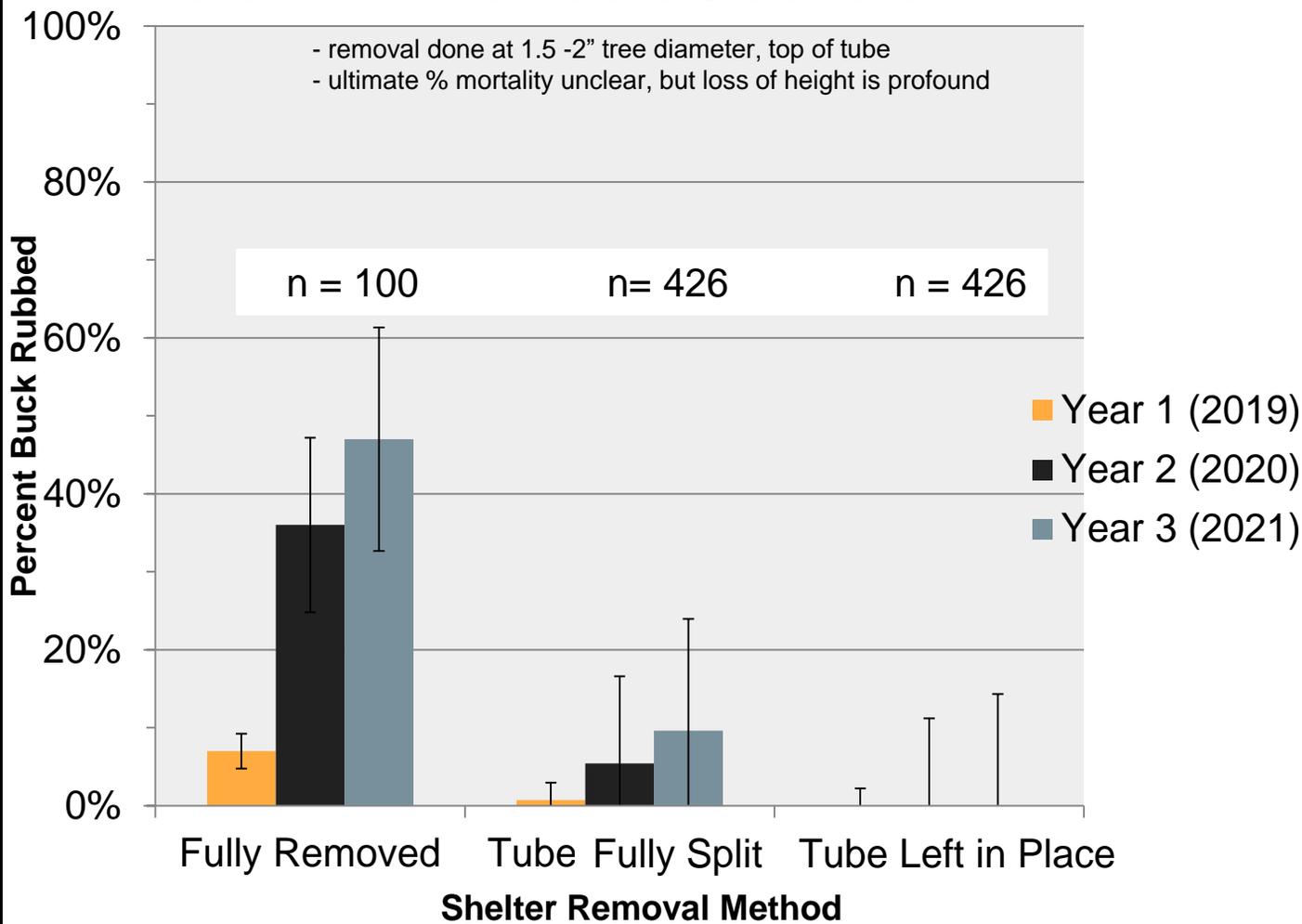


Tube Left in Place



Percent Buck-Rubbed Trees Per Shelter Removal Method

- removal done at 1.5 -2" tree diameter, top of tube
- ultimate % mortality unclear, but loss of height is profound



Fencing shrub clusters

Issue: survival of multi-stem shrubs

- not suited to 5' tubes??
- 2' tubes don't protect from deer

- Protect from voles with herbicide or stone mulch as usual
- **Protect from deer w/ 4' fence**
- Drawbacks: cost, floods



Results in 18 months for silky dogwood:



control – no fence
mean height: 26 cm



welded wire fencing
mean height 91 cm



Do 5' tubes work for multistem shrubs??



2' tube + cage for multistem shrubs



Beating multiflora rose



Methods

initial clearing w/
forestry mower



Methods

- typical planting
- broadcast Rodeo on rose after regrowth
- seeded pasture grass (limed/fertilized)



Methods

Normal
maintenance:

- 2x/yr herbicide
- 2-3x/yr mowing





2016 before work

2017 after work
(17 months later)



Beating reed
canary grass



Beating reed canary grass

Normal methods work:

- 5' tube
- 2x/yr herbicide
- 2-3x/yr mowing
- Photo: 2 yr old site



Future Tests:

- can fiberglass stakes reduce flopping syndrome?
- alternatives to Snapshot INSIDE tubes for weed control: pea gravel or 2A modified stone INSIDE tubes
- vole damage in years 5-8: stone mulch vs. herbicide spots
- biodegradable tree shelters

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