

Performance of Atlantic white cedar seedlings and rooted cuttings after 20 years in the field

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The goal is to grow trees like this.



Largest AWC in South Carolina

Johnny Stowe; SCDNR

Photo by Eric Hinesley (2008)

Background

- Strong interest in regenerating AWC since 1988.
- AWC is easy to propagate from stem cuttings.
- Historically, planting bare-root seedlings often yielded poor results, and nursery crops were unpredictable -- natural regeneration preferred.
- NC Forest Service now grows good quality containerized plants.

Effect of container volume on growth of AWC seedlings

Containers:

1. Ropak 45 multi-pot
2. Ray Leach super cell
3. Ray Leach D-pot
4. Hiko 530



6

10

16

32

Volume
(cubic inches)

Black tube is 7 inches long.

Photo by Eric Hinesley

AWC cuttings rooted outdoors in Spencer-Lemaire roottrainers



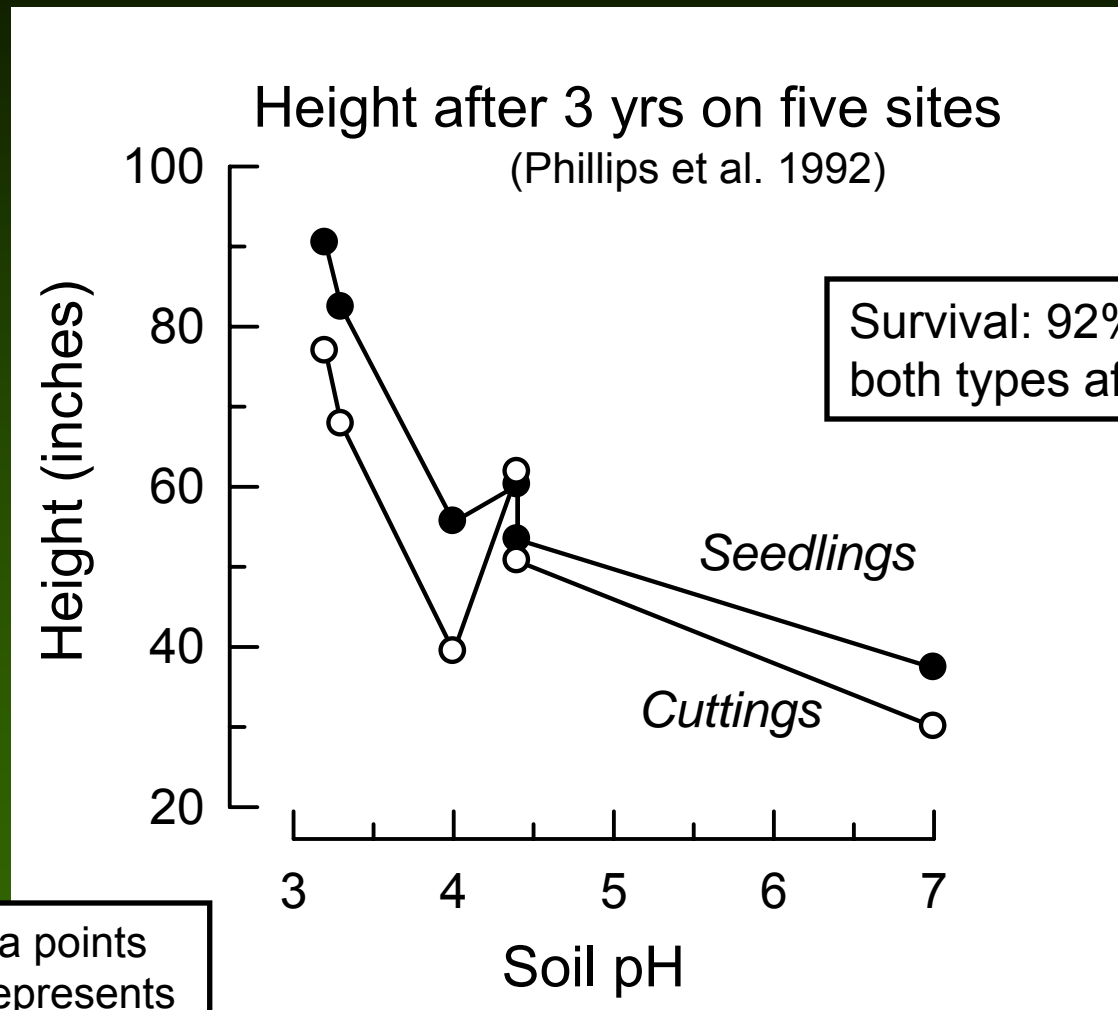
Hilsons: 8 x 4 cells in a tray,
Cell = 1.5 x 1.5 x 5 inches

Picture by Eric Hinesley (1994)

Establishment

- AWC demonstration plantings were established on five sites in eastern NC from 1989 to 1991.
- Rooted cuttings (Weyerhaeuser Corp.) and bare-root seedlings (NC Forest Service).
- Results for first 3 yrs were reported by Phillips et al. 1992 (7th Biennial Silvicultural Res. Conf., Mobile, AL. 17-19 Nov. 1992)

Height of AWC seedlings and rooted cuttings in relation to soil pH



Survival: 92% to 97% for both types after 3 yrs

Each set of data points on the X-axis represents a different site

Conclusions (Phillips et al. 1992)

- Growth and survival was best on acidic, peat soils.
- Bare-root seedlings and rooted cuttings were both adequate for regeneration, but seedlings might be better.
- Predation from deer and rabbits was not a serious threat to establishment in all situations.

Unanswered question:

What is the long-term performance of seedlings and rooted cuttings?

Recent measurements on Hoffman Forest site

- Soil: Croatan (peat, acidic)
- 1989 planting: bedded, not bedded.
- 1990 planting: not bedded.
- Measurements:
 - Survival,
 - Height,
 - Stem count and diameter.

Croatan soil series*

- Loamy, siliceous, dysic, thermic Terric Haplosaprists
- 0 to 28 inches – black muck (medium thickness)
- 28 to 33 – black mucky sandy loam
- 33 to 38 – dark brown sandy loam
- 38 to 60 – grayish brown sandy clay loam
- 60 to 80 – variegated grayish brown and dark gray loamy sand.

* <http://www2.ftw.nrcs.usda.gov/osd/dat/C/CROATAN.html>

Fire is a major formative process on the peat soils of eastern NC

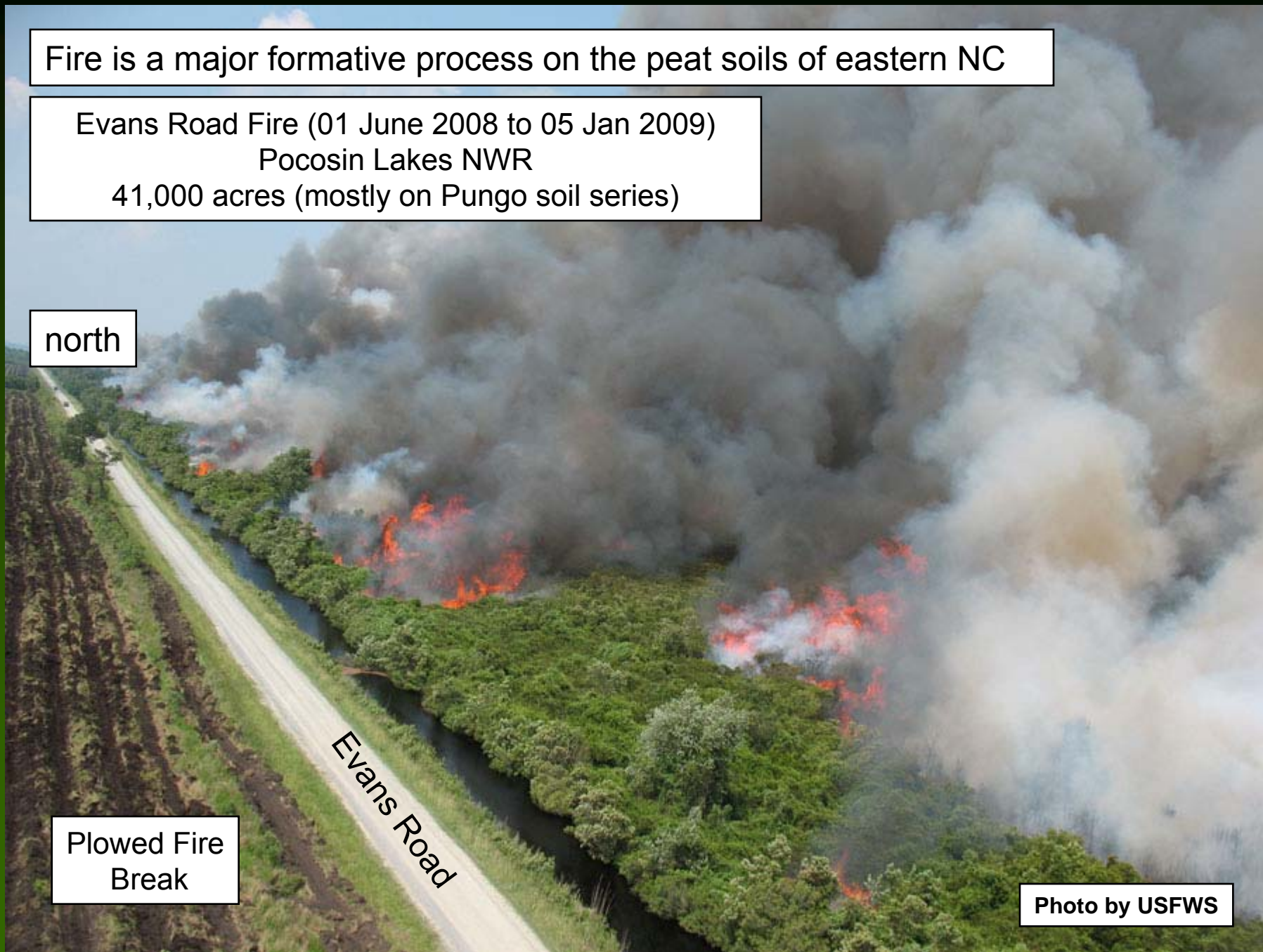
Evans Road Fire (01 June 2008 to 05 Jan 2009)
Pocosin Lakes NWR
41,000 acres (mostly on Pungo soil series)

north

Plowed Fire
Break

Evans Road

Photo by USFWS





Pond pine after Evans Road Fire

Large stump from an earlier forest, exposed by fire.

Photo credit USFWS

Table 1. Height of AWC at Hoffman Forest 20 years after planting

Type	Planting date	
	1989 (ft)	1990 (ft)
Seedlings	34*	33.7
	<i>ns</i>	**
Cuttings	34	29.3

1989 planting is averaged for bedded and not-bedded sites; 1990 planting was not bedded.

* $n = 36$ (1989); $n = 18$ (1990).

** Significant at $P \leq 0.01$.

Table 2. Diameter of AWC at Hoffman Forest 20 years after planting

Type	Planting date	
	1989* (cm)	1990 (cm)
Seedlings	13.4	14.4
	<i>ns</i>	<i>ns</i>
Cuttings	12.2	12.5

*1989 planting is averaged for bedded and not-bedded sites (n = 60); 1990 planting was not bedded (n = 30).

1 inch = 2.54 cm.

Table 3. Survival of AWC at Hoffman Forest 20 years after planting.

	1989		1990
	Bedded (%)	Not bedded (%)	Not bedded (%)
Seedlings	70*	76	87
Cuttings	90	87	80

*Each mean is based on 30 planting positions.

Other results:

- Bedding did not affect survival, height, or diameter after 20 years (Tables 1-3).
- Multiple stems were common; no clear distinction between seedlings and cuttings.
- Dead branches persist to base of trees. Produces loose knots. Pruning?

Conclusions

- After 20 years, there was no clear distinction in the performance of seedlings and cuttings; possible edge in favor of seedlings.
- Survival and growth was acceptable for both types.
- A series of carefully controlled experiments would be needed to determine if there is a difference in the performance of seedlings and cuttings.