

Stump Sprouts On Water Tupelo

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Few are aware of the magnitude and implications of stump sprouting in swamps of cut-over water tupelo (*Nyssa aquatica* L.) in the Southeastern coastal plains. Seldom are these swamps revisited; indeed, the maze of debris after logging is enough to deter the hardy. Swamps, moreover, have not been regarded as particularly desirable management propositions in the past. It is only logical, therefore, that little attention has been paid to swamps after they were logged. Fortunately, swamp-lands are more enticing endeavors now than they were in the past. Hence, as land managers return to cut-over swamps, they may become dismayed with what they find and even more puzzled at how to harvest and regenerate uncut stands in view of prolific stump-sprouting. Before we consider the management problems engendered by stump sprouting, let us examine a specific incidence in a water tupelo swamp.

Thirty Years After Logging

An outstanding example of what one may expect in a cut-over water tupelo swamp 30 years after logging was observed in the Wateree Swamp in Sumter County, South Carolina. The water level on this 12,000-acre tract of land¹ is influenced by the backwaters of Lake Marion, a lake formed by damming of the Santee River about 40 miles below the confluence of the Congaree and Wateree Rivers. All merchantable saw-timber was removed from the area between 1930 and 1939, just prior to flooding of the lake in 1941.

Today in the tupelo ruins vigorous sprouts persist on stumps of all sizes and are intermixed with trees of seed origin (Figure 1). In certain

areas this mixture predominates, while in other areas stump sprouts and trees of seed origin are intermingled with remnants of the parent stand. The larger stumps tend to have multi-sprouts with no single stem assuming complete dominance (Figure 2). In contrast, the smaller stumps usually have only two or three sprouts, of which one or two are dominant (Figure 3).

Average height, diameter, and age of the tallest sprout for several stumps and trees of seed origin are given in Table 1. Although the sample is mercifully small, it does show how well the sprouts have fared in comparison with trees of seed origin. Sprout growth in height and diameter appears to be as good as, if not better than, that of trees of seed origin. The low average diameter for the tallest sprouts on large stumps is somewhat misleading because the tallest sprouts were not necessarily the largest in diameter. There was an average of six sprouts on the larger stumps; over half of these were larger than 10 inches in diameter, and the sprouts with the largest diameters averaged 13.4 inches. The height of all the sprouts

over 10 inches in diameter averaged 73 feet. At this time, the stumps of larger diameter have three to four stems which are approaching merchantable size.

No discoloration or rot was found in 15 increment cores from sprouts (bored 12 inches above the old stump), but one core from a tree of seed origin was discolored near the pith. Out of at least 100 clumps of stump sprouts which we checked, we saw only two clumps that appeared to have a dubious future. On one stump the single sprout was suppressed and the stump was a rotten shell. In the other case one large sprout had broken off above the stump and the entire clump appeared to be heavily rotted.

On some larger stumps which had only a few sprouts the stumps had deteriorated between sprouts and left the sprouts as separate stems. Many years from now it may be difficult to tell whether these separate stems were from seed or sprout origin. They may appear to be swell-butted tupelo with large cat-faces,

¹This land is owned by South Carolina Public Service Authority, Santee-Cooper, Moncks Corner, S. C. We appreciate their cooperation in making the area available and helping us obtain information about it.



FIGURE 1.—Trees of seed origin intermingled with clumps of stump sprouts. Stump sprouts are in center background and right foreground. Two trees of seed origin are in the center foreground.

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Table 1.--Average height, diameter, and age of tallest sprout for stumps and trees of seed origin

Origin	Number: : samples :	Height		Diameter		Age ^{1/}	
		Average:	Range	Average:	Range	Average:	Range
		- - (feet) - -	- - (feet) - -	- - (inches) - -	- - (inches) - -	- - (years) - -	- - (years) - -
Seed	4	74	68-79	12.7	12.2-13.6	31	30-33
Sprout							
Large stump	4	78	72-82	10.8	9.1-12.2	30	29-31
Sprout							
Small stump	4	75	71-77	14.8	13.8-15.8	29	28-33

^{1/} Ages were determined by ring counts. Aerial photographs showed active logging in the sample area in September 1937.

a common occurrence in most swamps.

Implications

With this information on stump sprouting as background, let us take stock and see what we are faced with and what we might do.

Obviously a large majority of the stumps of water tupelo will sprout prolifically when cut; these sprouts will persist and grow as rapidly as trees of seed origin for at least 30 years. These sprouts will apparently be free from rot. (Although this paper deals with stump sprouting of

water tupelo, our observations to date indicate that stumps of swamp, *N. sylvatica* var. *biflora* (Sarg.) Walt., sprout in much the same way.) Future stocking of stands will be largely dependent upon parent stump density and distribution. In the Wateree Swamp, trees of seed origin predominate mainly in areas where they were not competing directly with stump sprouts. We counted approximately 150 to 200 stems per acre, including the remnants of parent stands. In view of the poor quality of some remnants and the large unoccupied areas between parent stumps, the first impression is that these stands do not compare favorably with well-stocked stands of seed origin. This impression may be biased by aesthetics; yields may be quite comparable. Actual comparisons between stands of stump sprouts and those of trees from seed origin were not made because of the enormous task and the probability of wide variation from locale to locale.

How do we regenerate tupelo in the future in view of the sprout problem? Many of our tupelo gum stands today came in after cypress cutting, in abandoned rice fields, or in other open areas. Actual instances of the regenerating of water tupelo have not been documented in the literature. If we are to regenerate tupelo by seed, it will be necessary to control stump sprouts. As the



FIGURE 2.—Stump on which three healthy and vigorous sprouts are visible. This stump actually has six sprouts, four of which have diameters larger than 10 inches and heights from 67 to 80 feet.



FIGURE 3.—On some smaller stumps one stem assumes complete dominance, but many have two stems which are almost equally dominant.

spraying of stumps will probably be uneconomical in swamps, what are the alternatives? Preliminary research on this problem at Charleston has shown that low-cut stumps, six inches or less above the soil, greatly reduce both the incidence and vigor of sprouting. Because of butt swell, tupelos are generally jump-butt—why not compensate the faller for cutting stumps extra low and then jump-butting? Mechanical equipment in the pine uplands now clips stems off at ground level—hopefully such equipment will be adapted and brought into the lowlands to alleviate similar problems there.

With mechanization and improved markets, harvesting tupelo for pulp alone may become economical, and, if so, management for stump sprouts may give the greatest short-term yields. In such a case high stumps would probably be favored.

Stump sprouting of water tupelo is a trait which must be considered in future cuttings of swamps. Whether stump sprouts will be suitable as regeneration will depend on management objectives.