TOP PRUNING MAY BENEFIT YELLOW BIRCH PLANTING STOCK

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Although good quality stock of yellow birch *(Betula alleghaniensis* Britton) can be easily produced in the nursery, many plantings fail because of poor sites and lack of care after planting. Two recent, small-scale planting trials, both under partial shade, suggest that top pruning at planting time can increase survival and growth during the critical establishment period.

The initial planting was made in the spring of 1967 using sorted 2-0 stock relatively uniform in size but slightly smaller than the stock recommended by Stoeckeler and Jones (1957). Equal numbers of seedlings were slit-bar-planted in: (1) scalped spots in a sodded opening, (2) a 120-foot diameter opening cut in second-growth northern hardwoods the preceding year, and (3) a shelter wood cutting in young second-growth under about 50 percent of full sunlight. All seedlings failed in the sodded opening the first year because of fall frosts. At the end of the second growing season, survival of untreated seedlings was 69 percent in the circular opening and 77 percent under the shelterwood cutting.

Trial One

Under the shelterwood cutting only, two types of top pruning were done on two-thirds (80) of the trees, the other one-third were check trees. In one top pruning treatment the entire crown was clipped off, leaving a single stub about 3 inches tall, free from branches. The second treatment removed half of the crown.

Survival and growth were generally better for both types of top pruned seedlings during both growing seasons (table 1). The reason for seedling failure could not be identified because the seedling was missing from the planting spot, possibly having been pulled out by animals. Approximately 10 percent of the remaining seedlings were deer-browsed during the second growing season; no browsing was observed the third year.

Top pruning gave good early growth that continued through the third year. At the end of the second growing season there were striking differences between the appearance of the buds and stems on top pruned trees compared with the checks. The check trees had dark colored bark with slender, brittle branches. The buds were small and offcolor suggesting that poor vigor and growth could be expected. The only check trees with good vigor appeared to be those in which the terminal bud had died and a lower branch was assuming dominance. In contrast, seedlings in both top pruning treatments had bright, greenish bark, sturdy branches and large, vigorous buds. Pruned seedlings had fewer side branches than the check trees and leaves were well distributed along the central stem.

TABLE 1.—*Response of 2–0 yellow birch to top pruning at the end of the 2d and 3d growing seasons under a shelterwood cutting*

Treatment and year	Survival	Height		Seedlings increasing in height 2d to 3d year	
		Average	Range	Proportion	Average increase
	Percent	*Inches*	*Inches*	*Percent*	*Inches*
Check					
2d year	77	6.7	4-24		
3d year	50	11.3	7-19	83	4.5
Half top					
2d year	69	12.2	7-21		
3d year	58	18.1	4-26	86	5.7
3-inch stem					
2d year	92	11.7	7-18		
3d year	92	18.1	8-24	91	7.3

Trial Two

A second trial, using sixty 2-0 seedlings in each treatment, was established in the spring of 1969 under another shelterwood stand cut 2 years earlier. Moderately vigorous seedlings were slit-bar-planted, and all sugar maple seedlings removed within 10 inches of the planted tree. As in the first trial, one of the two top pruning treatments was clipping the entire top to leave a 3-inch single stem. The other treatment consisted of clipping the terminal back to the largest bud and removing all side branches. Un-

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treated seedlings were used as checks. The seedlings were remeasured at the end of the first growing season (table 2).

TABLE 2.—*Response of 2–0 yellow birch seedlings to top pruning after one growing season under a shelterwood cutting*

Treatment	Survival	Seedlings increasing in height	Average height	Average height increase	Average branches per tree
	Percent	*Percent*	*Inches*	*Inches*	*Number*
Check	90	75	11.0	3.6	2.3
Largest bud ...	85	92	11.0	4.6	1.1
3-inch stem ...	79	78	6.7	4.4	1.0

Most mortality was caused by bindweeds that smothered the seedlings. Mortality was mostly concentrated in areas where the natural seedling density was low as a result of logging, and regrowth of both weeds and grass was common.

The best growth and form occurred in the treatment where clipping removed 25 percent of the seedling height, leaving the largest bud in a terminal position. Bark color and bud size in both top pruning treatments at the end of the first year again suggested favorable second year growth.

Conclusion

The results of these two trials indicate that top pruning may significantly influence survival, early growth, and stem form for the first few years after planting. Additional top pruning trials seem warranted in addition to studies of planting-site requirements and postplanting care for this high value species.

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HAVE YOU SEEN THESE?

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