

FALL-LIFTED HARDWOOD STOCK SURVIVES AND GROWS AS WELL  
AS SPRING-LIFTED STOCK

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A study just completed shows that time of lifting from the seedbed makes no difference in survival and early growth of several hardwood species--red oak (Quercus rubra L.), black walnut (Juglans nigra L.), sweetgum (Liquidambar styraciflua L.), yellow-poplar (Liriodendron tulipifera L.), and sycamore (Platanus occidentalis L.).

Stock was planted on southern Indiana coal strip-mine banks in April of both 1960 and 1961. One thousand 1-0 seedlings grown at Indiana's State Nursery were planted each year. Half had been lifted in the fall and half in the spring. Because of site variability on coal strip-mine banks, survival and growth of fall- and spring-lifted trees were compared in paired rows. Fall lifted seedlings were lifted, graded, and heeled-in after they dropped their leaves. They were taken from the heel-in beds in April and graded again before packing. Spring lifted seedlings were lifted, graded, and packed in April.

Survival of the five hardwoods was not affected by time of lifting (table 1). In the 1961 planting fall-lifted sweetgum and sycamore survived better than spring-lifted stock. But in the 1960 planting spring-lifted sweetgum and sycamore survived better. Lower

TABLE 1.--Survival of 1-0 seedlings by species and time of lifting<sup>1</sup>

Season lifted	1960 planting, first-year survival					
	Red oak	Black walnut	Yellow-poplar	Sweetgum	Sycamore	Average, all species
Fall.....	<i>Percent</i> 96	<i>Percent</i> 99	<i>Percent</i> 69	<i>Percent</i> 91	<i>Percent</i> 89	<i>Percent</i> 88
Spring.....	93	99	71	93	97	91
1960 planting, second-year survival						
Fall.....	92	95	49	86	87	82
Spring.....	82	98	59	85	93	83
1961 planting, first-year survival						
Fall.....	74	88	77	93	89	84
Spring.....	79	82	88	86	76	82

<sup>1</sup> Each figure represents 10 rows containing 10 trees each.

first-year survival in the 1961 planting was attributed to increased competition from volunteer vegetation.

Before subjecting the data to statistical analysis, survival percents were adjusted for mortality obviously due to toxic acidity, erosion, and inundation. First-year growth was negligible due to frequent dieback, so total height measured 2 years after planting was used to compare height growth. There was no difference in height due to time of lifting (table 2).

Thus hardwood stock lifted in the fall and heeled-in over winter will survive and grow as well as spring-lifted stock if it is graded before planting. A nurseryman in the Central States Region may lift hardwoods at his convenience after they have hardened-off in the fall. This means that he may schedule his work to keep equipment off wet nursery beds, provide jobs for key men over a longer period, and be ready to ship stock on short notice in the spring.

TABLE 2.--Seedling height at the end of second growing season by species and time of lifting

Season lifted	1960 planting				
	Red oak	Black walnut	Yellow-poplar	Sweetgum	Sycamore
Fall.....	<i>Feet</i> 1.0	<i>Feet</i> 1.0	<i>Feet</i> 1.0	<i>Feet</i> 1.2	<i>Feet</i> 2.2
Spring....	.9	.9	1.0	1.2	2.4