WIDER NURSERY SPACING PRODUCES LARGER NORTHERN RED OAK (QUERCUS RUBRA L.) SEEDLINGS

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Procedure

The effect of initial seed spacing or density on seedling size at the end of one growing season was tested at the Tennessee Valley Authority's nursery at Clinton, Tenn., in 1964. Four nursery beds were used, each representing one replication. Each 400-foot bed was divided into three 130-foot sections with 5-foot buffer zones between sections. Eight rows, 6 inches apart, ran the length of the bed; the acorns were planted 2, 4, and 6 inches apart in the rows. These spacings represented densities of 12, 6, and 4 seedlings per square foot, respectively.

Results

At the end of one growing season 800 seedlings per treatment (200 per replication) were

measured for total height and diameter at ground level. Average heights and diameters for each spacing were as follows:

	Number of seedlings per square foot		
	12	6	4
	Inches	Inches	Inches
Diameter at ground	0.17	0.24	0.26
Height	9.40	13.40	15.70

Analysis of variance and Duncan's Multiple Range Test indicate that densities of four and six seedlings per square foot produced significantly larger seedlings. At the end of one growing season those at the lowest density were 53 percent larger in diameter and 67 percent taller than those at the highest. Intermediate density seedlings were 41 percent larger in diameter and 43 percent taller.

Discussion

Tests by Limstrom et al. (2) showed that yellow-poplar seedlings with a ground-level diameter of at least 1/4 inch survived better than smaller seedlings. Funk (1) found that yellow-poplar seedlings that were tall as well as large in diameter not only survived better but grew faster, even after 8 years in the field. Williams (3) in a similar experiment with black walnut concluded that for best survival and early growth, seedlings should have a stem diameter of at least 7/32 inch. The northern red oak seedlings from this test were not field tested. The inference from the published evidence cited above, however, is that large seedlings survive and grow better than small ones. More experience with oak plantations is needed to determine whether the extra cost of growing seedlings at low density can be justified.

Literature Cited

1. Funk, D. T.
   1964. Premium yellow-poplar seedlings-8 years after planting, U.S. Forest Serv. Central States Forest Expt. Sta. Research Note CS-20.
2. Limstrom, G. A., Finn, R. F., and Deitschman, G. H.
   1955. Planting stock grades for yellow-poplar. Jour. Forestry 53: 28-32.
3. Williams, R. D.
   1965. Plant large black walnut seedlings for best survival and growth. U.S. Forest Serv. Central States Forest Expt. Sta. Research Note CS-38.