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LONG-SUPPRESSED PONDEROSA PINE SEEDLINGS

RESPOND TO RELEASE

by

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EDITOR'S
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Long-suppressed ponderosa pine seedlings and saplings have a remarkable ability to recover and resume normal growth when released. This fact is strikingly demonstrated by a study^{1/} begun in 1934 on the Pringle Falls Experimental Forest, near Bend, Oreg.

The study was carried out on two 1-acre plots in a mature, well-stocked lodgepole pine stand with an understory containing many suppressed ponderosa pine seedlings and saplings. The ponderosa pines were released on one plot in 1934 by removing the lodgepole pine overstory. At that time the ponderosa pines averaged about 40 years in age and 1.7 feet in height. The largest tree was 12.5 feet tall. The untreated plot was established in 1937 in a similar stand immediately adjacent to the released plot.

Measurements have been taken periodically on the two plots to provide a comparison of survival and growth of ponderosa pine. Since 1937, survival has been recorded on 25 milacre quadrats on each plot and heights have been measured on 51 selected potential crop trees, about equally divided between the two plots. Starting

^{1/}For an earlier report on this study, see: Mowat, Edwin L. Cutting lodgepole overstory releases ponderosa pine reproduction. Jour. Forestry 48: 679-680. 1950.

in 1948, stocking has also been estimated from records on 150 milacre quadrats on each plot. On the released plot, all trees on these 150 quadrats that were 1 inch d.b.h. or larger were measured for diameter in 1952 and again in 1958. The 30 trees measured for diameter represent the 200 trees of largest diameter per acre. On the unreleased plot, the trees were too small to provide diameter measurements.

RESULTS

The released plot now supports a vigorous stand of young-appearing trees, mostly full crowned with long, healthy needles. Current height growth of the best individuals amounts to a foot or more per year. Trees are fairly well spaced, although some groups are overly dense and there are a few holes in the stand.

The appearance of the unreleased plot is a sharp contrast. Here the lodgepole pine overstory still dominates the stand and the ponderosa pines remain in an inconspicuous understory position. Trees are generally short, crooked, and thin crowned.

Height growth of ponderosa pine seedlings following sudden release was very slow at first and then increased steadily. During the first 6 years, released seedlings made only slightly better height growth than the unreleased. Since this initial adjustment period, however, height growth of released trees has been about four times as rapid (table 1). The tallest measured tree on the released plot--28.3 feet--grew 7.5 feet during the 6 years from 1952 to 1958.

Diameter growth of the larger trees on the released plot is proceeding at a satisfactory rate. In 1952 average diameter of the 200 largest trees per acre, as estimated from the quadrats, was 2.6 inches. During the ensuing 6 years, average diameter of these trees increased to 3.7 inches, a growth of 1.1 inches. By 1958 the largest measured tree was 9.4 inches d.b.h. and had grown 2.4 inches in diameter during the preceding 6-year period.

Mortality among the newly released seedlings was very high at first. During the last decade, however, very few deaths have occurred, indicating that the released trees have become adjusted to their new environment. Only 16 percent of the original released seedlings were still living in 1958. Despite these heavy losses, the released plot is 31 percent stocked with ponderosa pine, and trees are well enough distributed to almost fully occupy the site by the time they reach commercial thinning size.

The results of this small-scale study indicate that foresters can release small ponderosa pines that have been severely suppressed, with confidence that they will respond and attain normal growth following a short adjustment period.

Table 1.--Average height and height growth of released and unreleased ponderosa pine seedlings^{1/}

Year	Height		Periodic annual height growth	
	Released	Unreleased	Released	Unreleased
----- <u>Feet</u> -----				
1934	4.3	--	--	--
1937	--	3.4	0.12	0.10
1940	5.0	3.7	.35	.08
1943	6.0	3.9	.52	.13
1947	8.0	4.4	.66	.16
1952	11.3	5.2	.63	.12
1958	15.1	5.9		

^{1/}Basis: 29 selected seedlings on the released plot and 22 selected seedlings on the unreleased.