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RESEARCH NOTE

Conifer Species Trial, Chatham Michigan Survival and Growth Summary After 14 Years

by Raymond O. Miller
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ABSTRACT

A plantation was established on a clearcut hardwood site in Chatham Michigan in May of 1982 to compare the survival and growth of red pine, Kellogg hybrid pine, European larch, Japanese larch, and red oak. After 14 years, all species had adequate stocking although red pine survived best. The larch species tallest and had the largest diameters.

INTRODUCTION

A plantation was established on a clearcut hardwood site in Chatham Michigan in May of 1982 to compare the survival and growth of red pine, Kellogg hybrid pine, European larch, Japanese larch, and red oak. The site is part of Michigan State University's Upper Peninsula Experiment Station at Chatham Michigan, and is in the NE 1/4 of Section 34 of Rock River Township (T46N, R21W of Alger County).

Growing conditions at Chatham can be severe. The average annual temperature is 42° F with an average high of 69° F and low of 14° F. Actual low temperatures near -27° F are not uncommon. Annual precipitation averages 30" with an average snowfall that frequently exceeds 200" (over 300" last winter). There are about 90 frost-free growing days at this site.

A storm damaged sugar maple stand on sandy loam soil was clearcut from the site prior to 1981. Part of the area was treated in September of 1981 with 3 quarts/acre of Roundup to kill stump sprouts and other weeds. Application was made with a backpack mist blower. Bare-root seedlings of each species were hand-planted on the site in May of 1982 and have remained untreated since.

Seedlings were planted in 1/4-acre (80' x 136') plots with 8' between rows and 4' between trees within rows, yielding about 340 trees per plot, or 1360 trees/acre. One plot of each species together with an equal-sized untreated control plot were randomly located in each of 4 replications.

MEASUREMENTS

Survival was tallied in each plot in May of 1996. Deer browsing was observed to be severe throughout the site. All sprouts and shrubs were heavily browsed as was the planted red oak. Most of the oak had died so these plots were ignored in subsequent measurements. The untreated control plots were also ignored during the 1996 measurements, except for the observation that the hardwood regrowth in these plots was substantial compared to the plots that had been treated with Roundup in 1982.

Total height and diameter at breast height was measured on all trees in the two center rows of each conifer plot in May of 1996. An average of 18 trees were measured in each plot. Analysis of variance was used to test for differences among species for survival, height growth, and diameter growth.

RESULTS

Red pine and hybrid pine survival was statistically similar. The same was true for the two larches. The pine species did survive better than the larches, however. After 14 years, stocking for red pine was 856 trees/acre, for hybrid pine was 734 trees/acre, for Japanese larch was 598 trees/acre, and for European larch was 476 trees/acre.

Growth of the two larch species was statistically the same, averaging 23.4' tall and 3.4" D.B.H. The pines were significantly smaller, averaging 13.2' tall and 2.6" D.B.H..

Larches grew 77% taller and 31% more in diameter than pines on this site. Although about 60% of the original larch seedlings have died, there are still enough trees remaining to fully stock the site. We will continue to monitor volume growth on this site over the next 10 years to determine the financial returns of these species growing under these conditions.

Species: European Larch

Species	Block	Number	Height	D.B.H.	Survival %
European Larch	1	17	19.66	3.28	28
European Larch	2	20	24.36	4.20	47
European Larch	3	13	23.5	3.78	38
European Larch	4	16	19.56	3.02	31
Test Mean			21.8	3.6	36 %

Species: Hybrid pine

Species	Block	Number	Height	D.B.H.	Survival %
Hybrid pine	1	18	11.63	2.22	54
Hybrid pine	2	22	13.35	2.67	47
Hybrid pine	3	19	12.52	2.54	55
Hybrid pine	4	20	12.55	2.38	61
Test Mean			12.5	2.5	54 %

Species: Japanese Larch

Species	Block	Number	Height	D.B.H.	Survival %
Japanese Larch	1	15	22.98	3.26	30
Japanese Larch	2	25	22.58	3.54	49
Japanese Larch	3	22	17.98	2.73	37
Japanese Larch	4	26	25.65	3.78	59
Test Mean			22.3	3.3	44 %

Species: Red Pine

Species	Block	Number	Height	D.B.H.	Survival
Red Pine	1	17	14.53	2.78	66
Red Pine	2	19	13.92	2.68	53
Red Pine	3	16	14.75	2.81	74
Red Pine	4	18	12.12	2.33	59
Test Mean			13.8	2.6	63 %