

Development and Growth of Coniferous Plantations in Southern Michigan, U. S. A.

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The W. K. Kellogg Experimental Forest of Michigan State University is an excellent demonstration of reforestation on land previously farmed and then abandoned in the early 1930s. The study was conducted to evaluate the performance of six coniferous tree species in plantings established more than 40 years ago. Included species are red pine, eastern white pine, Scotch pine, European larch, white spruce, and Norway spruce.

Tree measurement, together with site characteristics, were obtained from 35 field plots in unthinned and thinned stands. Understory plants were also identified in selected plots within plantations.

The species varied in overall performance. All the selected plantations have been developing normally and have grown far above average, exceeding 7 cubic meters per hectare per year of merchantable volume in all unthinned stands. Thinning practices decreased the residual growing stock, but increased diameter growth rate for all species. Total volume production has been identical between unthinned and thinned stands. Thinning is essential in overstocked stands to reduce mortality, to yield high quality crop trees, and to obtain intermediate

income.

The development of understory vegetation was outstanding in Scotch pine and European larch plantations. Competition could not be avoided with well-growth hardwoods in these stands.

Eastern white pine in mixture with red pine plantations, and European larch stands were damaged by insects and disease. A high rate of juvenile mortality was also recorded for eastern white pine. The stagnated growth rate of European larch may be attributed in part to larch sawfly attack.

Growth and yield performance between species must be guardedly since the original experiments were not set up for inter-species comparison. More research is needed to determine the comparative performance of different species on different sites for highly successful reforestation. However, the study does suggest that red pine is the most generally reliable native species for plantations in southern Michigan, but it also suggests that with careful seed selection Norway spruce and Scotch pine will outgrow native coniferous tree species.