

J. J. Jokela

Major emphasis at the Illinois Agricultural Experiment Station has been on species adaptation studies. Principal efforts have been directed toward the determination of the suitability of conifers for reforestation of abandoned farm lands and for afforestation in the Prairie Region. Exotic and western conifers have generally performed poorly in Illinois plantations. Current work is therefore largely directed toward ascertaining the site requirements of northern pines and southern pines, and how far south and north, respectively, of their natural ranges these species can be planted safely.

A survey of existing forest plantings was begun in 1938. Periodic measurements of a limited number of plantings encountered in this survey are being continued. As a follow-up to this survey several hundred experimental plantings of native and exotic coniferous and deciduous species were established in the early 1940's at several locations. Sixty-seven of these plantings represented 31 known seed origins.

Jack, red, and white pines have done well to date on suitable sites throughout the northern three-fourths of the state. There is some evidence that white pine might also be adapted to the remainder of the state. The use of shortleaf and loblolly pines is limited to the southern one-fourth of the state because of their susceptibility to winter injury.

Notable exceptions to the poor performance of exotics are Norway spruce and European larch, which have not exhibited the "early maturity" of other conifers on prairie soils.

All 10 of the ponderosa pine provenances included in the experimental plantings did well for the first 10 growing seasons. Soon thereafter symptoms characteristic of "needle blight" disease appeared in many plantings. By age 15 all plantings from seed sources west of the continental divide had failed completely. Plantings from seed sources east of the divide appeared little or not at all affected.

These and other results will be covered in greater detail in a report to be published soon which will incorporate the results of the plantations survey and the first 15-year performances of conifers in the experimental plantings mentioned above.

The Illinois Station is currently conducting several tests of selections, hybrids, and seed sources in cooperation with other agencies, and small scale tests of purported superior Christmas tree strains of Scotch pine.

The improvement of eastern cottonwood through selection and breeding has been given initial priority in the expanding program of tree improvement research at the Illinois Station. A study of natural variation in Illinois cottonwood was begun in 1959. Several tree populations of seedling and clonal origin have been established for the purpose of determining heritabilities (in both the narrow and broad sense) of economic traits and the genotypic and phenotypic correlations between these traits. A preliminary and yet incomplete survey of natural cottonwood stands has not revealed any significant deviation from a 1:1 sex ratio or differences in growth rate or form associated with sex.