Tamarack

Forest Service
U. S. DEPARTMENT OF AGRICULTURE

TAMARACK

(*Larix laricina*)

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Tamarack is a small to medium-sized tree with a straight, round, slightly tapered trunk. In the United States it grows from Maine to Minnesota and as far south as West Virginia, with the bulk of the stand in the Lake States. Northward its range extends throughout the greater part of Canada. Occasional trees are 100 feet high and 30 inches in diameter, but the average mature tree is considerably smaller; although tamarack is commonly found in swamps and bogs, it also occurs on adjoining upland areas where the better drainage results in more rapid growth. Tamarack is one of the few trees which will grow in cold, wet situations; this gives it a high value where it is necessary to maintain a forest cover under such conditions.

The wood is coarse in texture and has an intermediate rank in strength properties and decay resistance. It was formerly used in considerable quantities for lumber, but in recent years the production of tamarack lumber has dropped to an almost negligible quantity, amounting to less than 2 percent of the maximum which occurred in 1909.[1] The wood is suitable for the cheaper grades of paper, and at present is used principally in the manufacture of wrapping paper and fiberboard and in smaller amounts for lumber and cross ties.

Nomenclature.—Tamarack is the commonly accepted name. Other names in more or less common use are Eastern larch, larch, hackmatack, American larch, and black larch.

Distribution and growth.—Tamarack grows throughout nearly all of Canada except in the north central portion and along the western coast. In the United States its range extends down from Canada through New England and the Lake States as far south as northern West Virginia (see fig. 1). Tamarack also occurs in central Alaska in the vicinity of the principal rivers. Throughout its range the species is characteristic of peat swamps. In some northern locations in grows under temperatures varying from 60° F. below zero to 90° F. above. In the United States it is generally found in swampy locations but also, in the southern portions of its range, on the cold, northern slopes of mountains adjoining small bogs and peaty areas.

Tamarack frequently forms pure stands of considerable extent. It also grows in mixture with other species, especially with black spruce in the north. In the southern parts of its range on the better drained soils, tamarack is commonly found growing in mixture with a number

[1] It is quite possible that the destruction of standing tamarack timber by the larch sawfly has been a factor in the marked drop in tamarack lumber production.

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of species, including red spruce, white spruce, Northern white cedar, Eastern hemlock, balsam fir, red maple, yellow birch, and black ash.

Under favorable conditions tamarack grows rather rapidly. Measurements taken in Maine showed for trees 30 years old an average diameter of 10 inches and an average height of 45 feet, and for trees 45 years old an average diameter of 18 inches and an average height of 60 feet. Average mature trees are about 70 feet in height and 20 inches in diameter. In shallow soil, underlaid by rock or stiff clay and fairly dry, several large roots are formed which bend sharply away from the trunk a short distance underground. In deeper, swampy soils the roots penetrate farther into the ground, but are not so large in diameter and are more numerous. Many of them are long, tough, and stringlike.

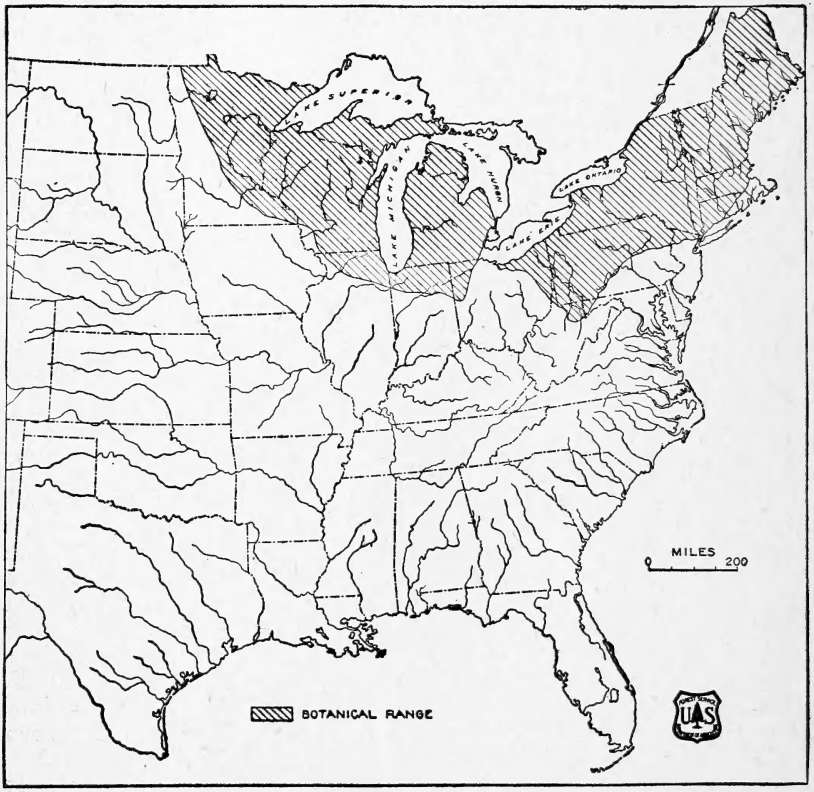

FIGURE 1.—Range of tamarack (*Larix laricina*) in the United States.

Tamarack makes its best growth on fairly well drained soils but can exist on saturated soils under conditions which most other species cannot endure. Under conditions favorable to other species as well as tamarack, the latter may be crowded out by the competing species as it cannot endure heavy shading at any period of its life. The tree produces seed frequently, but abundant crops occur only at irregular intervals. The seeds are winged and readily carried by the wind.

The seedlings become established easily in a variety of soils, provided there is not too much cover from bushes or trees.

Some 40 years ago an insect known as the "larch sawfly" made its appearance on tamarack trees in New England. This insect has spread north into Canada and south and west in the United States, destroying a considerable proportion of the tamarack in its path. It is difficult to find an area within the tamarack range that has not been more or less affected by the sawfly.

Supply.—A forest survey recently conducted in the Lake States,[2] where a large proportion of the supply of tamarack in the United States is located, shows a stand of tamarack of saw-timber size as follows:[3]

	Board feet
Minnesota	137, 340, 000
Wisconsin	81, 870, 000
Michigan	75, 750, 000
	294, 960, 000

It is probable that an additional 30,000,000 board feet of tamarack saw timber, equivalent to about 10 percent of the stand in the Lake States, is scattered over the rest of its range in the United States. The total stand of tamarack saw timber in this country is estimated roughly at 325,000,000 board feet.

Production of lumber.—The production of tamarack lumber was first recorded separately in 1899, when the cut was 9,325,000 board feet (fig. 2). Production increased rapidly and 10 years later (1909) reached its maximum of 157,192,000 board feet. After 1909 production decreased markedly and in 1932 [4] reached an all-time low of 1,574,000 board feet—about 1 percent of the maximum. By 1942 production had risen to 3,436,000 board feet. In 1943 production decreased to 2,921,000 board feet. The average anual production of tamarack for the 10-year period 1934–43 was 2,680,000 board feet. The Lake States (Minnesota, Wisconsin, and Michigan) have furnished almost all of

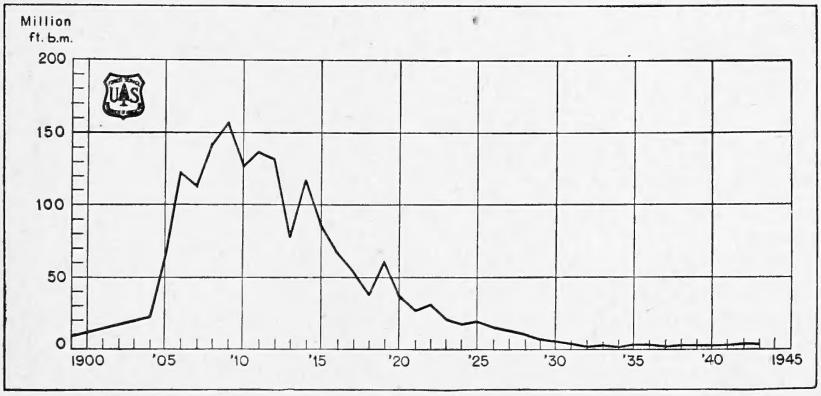

FIGURE 2.—Lumber production of tamarack (*Larix laricina*), 1899–1943.

[2] This survey was conducted by the Lake States Forest Experiment Station of the Forest Service, U. S. Department of Agriculture, in 1936–38 as part of a Forest Survey of the United States.

[3] Figures based on ¼-inch International log scale.

[4] A year of depression in business.

the tamarack lumber reported in the lumber cut statistics, with an occasional small amount from other States within the tamarack range.

Cross ties.—The average number of tamarack cross ties treated annually with preservatives in recent years (1939–42) was approximately 112,000.[5] If it is assumed that 75 percent of all tamarack ties are treated and 25 percent are used without treatment, the total number used annually would be about 150,000. Of this total, some were hewed and some were sawed.[6] It is estimated that 75 percent were hewed, or approximately 112,000 ties, equivalent to 3,400,000 board feet.

Pulpwood.—In 1916 [7] the consumption of tamarack pulpwood was 33,271 cords. After 1916 consumption increased and 10 years later reached a maximum of 94.695 cords. Since 1926 it has fallen off, dropping to a minimum of 9,587 cords in 1935. The average annual consumption of tamarack pulpwood for the 10-year period 1931–40 was 14,344 cords, equivalent to approximately 4,300,000 board feet—more than the amount used for lumber or for cross ties. It is estimated that the consumption of tamarack for pulpwood in 1944 was somewhat less than the 10-year average.

In addition to the tamarack used for lumber, cross ties, and pulpwood, indeterminate quantities are used for telegraph poles, ship timbers, and other products. The total annual consumption of tamarack in recent years for all purposes is roughly estimated at the equivalent of 15,000,000 board feet.

Properties.—The heartwood of tamarack is yellowish brown to russet brown and without a reddish tinge. The sapwood is whitish and narrow—generally less than an inch wide. The wood is coarse in texture and slivery and without odor or taste. The annual rings are made up of a band of light-colored springwood and a band of darker, denser summerwood. The transition from springwood to summerwood is abrupt. The wood is moderately heavy,[8] moderately strong, moderately stiff, moderately hard, and moderately high in shock resistance. It has a moderately large shrinkage in drying and the reputation of warping and checking but little in the seasoning process. It is comparatively difficult to ignite—a valuable characteristic for practically all uses except fuel. The wood [9] has an intermediate rank in ability to resist decay, being placed in the third of five classes listed according to durability. It is very difficult to penetrate with a preservative.

Tamarack can be readily reduced to paper pulp by the sulfate process [10] and produces a pulp suitable for the manufacture of strong,

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[5] The statistics covering the quantity of wood treated with preservatives, compiled annually by the U. S. Forest Service in cooperation with the American Wood-Preservers' Association, group both tamarack and western larch together under the name "tamarack." In 1939, 1940, 1941, and 1942, however, it was possible to separate the two species.

[6] Sawed ties are classed as lumber and are included in the statistics for lumber production.

[7] The earliest year for which statistics on tamarack pulpwood are available.

[8] The average weight of tamarack in an air-dry condition (12 percent moisture) is 37 pounds per cubic foot.

[9] Refers to heartwood. The sapwood of all species lacks durability when exposed to conditions favorable to decay.

[10] Six processes are used commercially in making paper pulp from wood. One is the mechanical or ground-wood process, in which the wood is reduced to pulp on a grindstone. The yield approaches 100 percent of the weight of the wood. Four are chemical processes—the sulfite, sulfate, soda, and neutral sulfite. They depend upon the dissolving action of chemical reagents which remove essentially all of the binding material (lignin) surrounding the cellulose fibers and leave them in a fairly pure state. The removal of the lignin is accomplished by cooking the wood chips with the proper chemical under steam pressure. The yield of pulp is about one-half the weight of the wood. In a sixth process, the semichemical, part of the lignin is removed by chemical means, and the resultant pulp, containing some lignin, is further refined by mechanical means. The yield of semichemical pulp is intermediate between the yields obtained with the mechanical process and the chemical processes.

tough papers and fiberboard. It also reduces readily by the mechanical process, yielding a pulp suitable for nearly all of the uses requiring ground wood. The power required to operate the grinders, however, is about 50 percent more than for white spruce—one of the woods long used in this country for paper making.

Principal uses.—Tamarack is used principally for pulpwood, lumber, and cross ties and also for mine timbers, fuel, fence posts, telegraph poles, scaffolding poles, and ship knees. The wood is pulped almost entirely by the sulfate process and the resulting pulp made into wrapping paper and fiberboard. The lumber goes largely into framing material for small houses. Some is used for tank construction and ship planking, and a small proportion for boxes and crates. Tamarack cross ties are generally treated with a preservative. The wood is used for fuel in considerable quantities, and while it does not ignite as readily as many other woods it is satisfactory for burning in stoves. Tamarack ship knees were widely used in the days of wooden ships. These knees were cut from trees grown under conditions which produce large roots extending almost at right angles to the trunk a short distance below the surface of the ground, each knee being made up partly of the root and partly of the trunk just above the ground. They still have a limited use in boat construction. The long, slender, flexible roots produced in soft, deep soils were formerly used by the Indians as a substitute for string or thread, especially for binding together the strips of bark used in making canoes.

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U. S. GOVERNMENT PRINTING OFFICE: 1945

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.
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