

United States Department of Agriculture,
FOREST SERVICE.

GIFFORD PINCHOT, Forester.

SILVICAL LEAFLET 32.

TAMARACK.

Larix laricina (Du Roi) Koch.

Tamarack is valuable for shipbuilding, railroad ties, posts, sills, and such other uses as require hard, durable wood. It is one of the few trees which will grow in cold, damp situations, unfit for agriculture or for other timber-producing trees, a fact which gives it considerable silvicultural importance.

RANGE AND OCCURRENCE.

The range of tamarack is transcontinental. It grows from the Atlantic coast to the Pacific, where it is found in the valley of the Yukon. From the northern limit of tree growth, along the shores of the Arctic Ocean and Hudson Bay, it extends southward to Pennsylvania, West Virginia, Indiana, Illinois, and Minnesota. It is found in the Canadian Rockies, between 53° and 56° N.

Throughout its range it is characteristic of sphagnum bogs and muskegs. In the southern part of its range it is frequently found on cold northern slopes of mountains, but is more common on low, level situations.

In the eastern part of its range it grows from sea level to 4,000 feet, while in Alaska the maximum altitude at which it has been observed is 1,675 feet. In West Virginia it has been reported at 2,360 feet.

The separation of the tamarack found in Alaska into a new species (*Larix alaskensis*) has recently been advocated, but as yet this is still under consideration.

CLIMATE.

On account of its very wide range, tamarack experiences a great diversity of climatic conditions. In the south it finds along the Atlantic a humid climate with frequent fogs and an annual precipitation of from 30 to more than 50 inches. The seasonal range of temperature is moderate, and temperatures of 30° F. below zero, or of 100° above, are rare. In Alaska and British Columbia, however, it is subjected to great seasonal ranges. The temperature falls to 60° F. below zero during the winter, and on rare occasions to 80°, and rises above 90° F.

in summer. In this region the precipitation may be as low as 12 inches, but owing to weak insolation and damp soil, this is not so likely to be harmful to vegetation as in warmer regions. The growing season under these conditions may be as short as six weeks.

ASSOCIATED SPECIES.

Tamarack frequently forms pure stands, often of considerable extent. Typical stands are fairly open, and the crown cover is never very dense. The most common associate of tamarack is black spruce. These two species grow in similar situations and have about the same range, although tamarack grows a little farther north, and also farther south in Indiana and Illinois. In the south it is sometimes mixed with arborvitæ, balsam, black ash, red maple, and near the southern limit, with tupelo. On the better-drained soils it is commonly found scattered among such species as red and white spruces, hemlock, balsam, balm of Gilead, aspen, birches, red and sugar maples, sassafras, hawthorn, willows, and poison sumac. One by one these associates disappear with increase in latitude; the last to remain are white and black spruces, willows, paper birch, and aspen. In Labrador tamarack is the most abundant tree except black spruce, which it exceeds in size. In Alaska tamarack is also associated with black cottonwood and red alder.

HABIT.

Tamarack is a straight, slender tree, averaging under favorable conditions about 70 feet in height and 20 inches in diameter at maturity. It very rarely attains a height greater than 100 feet, or a diameter of more than 30 inches. When grown in the forest tamarack has a straight, clear bole and a small, pyramidal crown. In the open the branches become more slender and drooping, and grow lower on the bole. The root system is rather broad and shallow; in swampy ground the tree has stringy roots, while in drier soil bends are formed by the large roots starting downward, then turning out. These bends are used as knees in shipbuilding. The wood of tamarack is hard, resinous, rather coarse grained, and durable. The bark is thin, reddish-brown, and scaly.

Under favorable conditions tamarack grows fairly rapidly. Measurements taken in Maine showed that trees at 30 years of age averaged 45 feet in height and 10 inches in diameter, while those 45 years old had reached an average height of 60 feet with a diameter of 18 inches.

SOIL AND MOISTURE.

Although a characteristic tree of spagnum swamps, tamarack does not do well where its roots are submerged, and makes its best growth in fresh soils which are fairly well drained. Its presence on saturated soil probably indicates, instead of a special requirement, an ability to

exist under conditions adverse to other species which, by their greater tolerance, are often able to crowd it from the better soils.

Since it is a shallow-rooted tree, tamarack does not demand a deep soil. It will grow on soils of nearly every consistency, from stiff clay to coarse sand, provided there is a sufficient amount of available soil moisture. It thrives on moderately retentive loams, especially when such soils are enriched with leaf mold and forest débris.

TOLERANCE.

Tamarack requires a great deal of light throughout its life, and will not at any time endure heavy shading. Even under the light foliage of mature tamarack stands the young saplings find it difficult to exist, and produce slender poles of very slow diameter growth, which are soon broken or blown down after the removal of the old trees. Tamarack stands are very commonly even-aged. In mixture with other species, it either forms an overwood or is forced out of existence.

REPRODUCTION.

Tamarack is a frequent and abundant seed bearer. Under favorable conditions it begins to produce cones at a relatively early age, probably between the tenth and twentieth years. Some seeds are borne annually, but years of especially abundant production occur at intervals of from two to four years.

The seeds ripen at the end of the first year and fall during the late autumn and winter. They are winged, and are adapted to dispersal by the wind. Suitable conditions for germination and the growth of seedlings are afforded by fresh mineral soil clear of trees or bushes and supporting a protecting cover of sparse grass or annual herbs. Germination also takes place on the organic soil, such as the newly made land at the margins of peaty lakes. The seedlings require slight protection and grow fairly rapidly in height, which enables them to persist in mixture with more tolerant, but slower growing, species of the same age.

MANAGEMENT.

Tamarack is best adapted to growth in pure stands, and should be managed under a clean-cutting system. Seed trees should be left in groups large enough to give the individuals sufficient strength to stand until reproduction is assured. Since tamarack takes deeper root on drier soils, the seed trees should be selected from drier, higher points in the forest, when possible. This also gives the wind a better opportunity to scatter the seeds over the lower surrounding areas. When tamarack is grown with other species clean cutting is again advisable, for its need of light, coupled with its quick growth, enables it to form an overwood.

