

Virginia Pine (*Pinus virginiana*) in Southern Indiana

DANIEL DENUYL, Purdue University

The original distribution of Virginia pine in Indiana is defined by Deam¹ who made a study of its distribution. In his book, "Trees of Indiana", he states that, "The distribution in Indiana is quite limited, and has never been understood by authors who variously give it as found throughout the southern part of Indiana. It is confined to the knob area of Floyd, Clark and Scott Counties, and the southeastern part of Washington County. In the original forest it is confined to the tops of the knobs where it is associated with *Quercus prinus*. It propagates easily from self sown seed, hence is soon found on the lower slopes of cut-over lands, and soon occupies fallow fields. It is now found in the open woods several miles east of the knobs in the preceding counties, but pioneers of this section say it was not a constituent of the original forests but has come in since the original forests were heavily cut over. It is believed that it crowned the knobs over our area from 5-10 miles wide extending through the counties named and extending northward about 25 miles. This species is found in the open woods on a few hills on the Millport Ridge in the northern part of Washington County, and it appears as if native, but investigation showed that it had spread from a tree on the site of a pioneer's cabin. It is also found as a frequent escape on the wooded bluff of Raccoon Creek in the southern part of Owen County, and appears as native here. It is associated on the bluff and slope with hemlock".

A study of the present distribution of Virginia pine shows it to be much more widely distributed than that reported by Deam. Its range has been extended through planting because it was commonly planted on farmsteads, school and church grounds in southern Indiana and from these planted trees natural regeneration has occurred.

One of the best examples of natural regeneration from a planted tree is that reported for Monroe County by Potzger.² His study showed that from a tree planted about 1860 a naturally established stand of pine has developed on an abandoned orchard site. Other similar occurrences have been observed in southern Indiana.

During the past 10 years Virginia pine has been used for re-forestation purposes. This use has also extended its distribution since natural regeneration from planted trees is sometimes encountered.

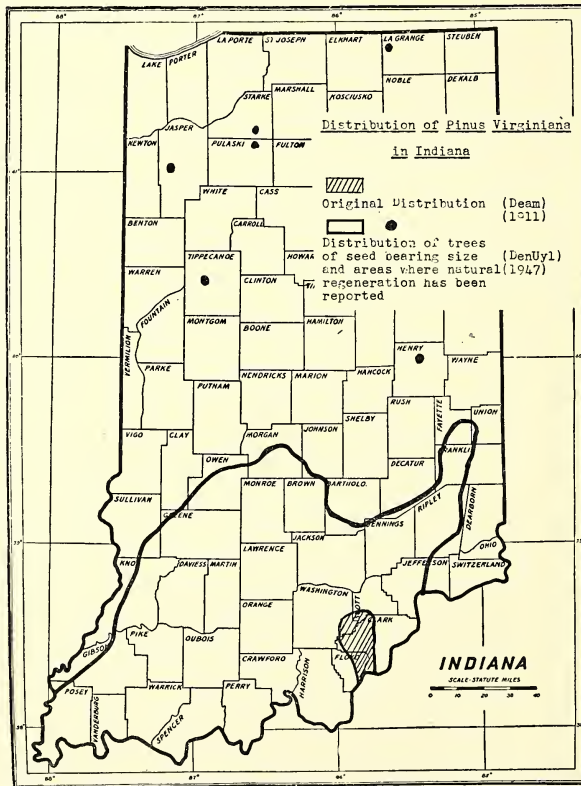
The growth characteristics that it exhibits under southern Indiana conditions are best illustrated by describing what has taken place on the Clark State Forest.

¹ Deam, C. C. (1921) Trees of Indiana, Publication 13, Department of Conservation, State of Indiana.

² Potzger, J. E. (1931) Some observation on *Pinus virginiana* Mill. in Monroe County, Indiana. Proc. Ind. Acad. Sci. Vol. 44.

In 1929, a timber cruise covering a portion of the Clark State Forest was made. At that time Virginia pine was a common associate of the mixed hardwoods. The total number of hardwoods and pine ranged from 80 to 250 trees per acre over 4 inches in diameter. Of this total, Virginia pine comprised from 8 to 50 stems per acre and varied in size from 4 to 16 inches in diameter.

In 1946, a cruise of this same area showed Virginia pine still present with approximately the same number of stems per acre. On some portions of the area Virginia pine trees over 14 inches in diameter had been cut prior to 1946. If these trees are added to the number



present in 1946, it indicates that the percentage of Virginia pine had increased during the 17-year period. In addition to the 1929 timber cruise, sample plots to study the growth of Virginia pine were established. These plots were located on a portion of the State Forest where the pine occurred in a pure stand. A brief summary of the establishment and growth of the pine on this area will serve to illustrate some of its growth characteristics.

The land was farmed for a few years and about 1905 it was abandoned. A few years later the eroded old field was acquired by the State of Indiana and made part of the Clark State Forest. The record of this area prior to 1929 shows that Virginia pine invaded this old field and at the time the field was abandoned it supported a few pine trees of seed bearing size.

In 1929, the stand of pine consisted of trees 2 to 14 inches in diameter and numbering approximately 500 stems per acre. The average age of the stand was 20 years indicating that most of the trees became established about 1910. There were a few hardwood trees in mixture with the pine which consisted principally of sassafras.

Remeasurements of the sample plots in 1946 show that the stand per acre averaged 375 trees ranging in size from 3 to 16 inches. The growth of the pine during this 17-year period averaged 1 cord per acre annually. In this stand the Virginia pine has developed into a tree with a tall thin bole, few side branches, thin, shade-developed foliage and a small crown. The total height of the trees varies from 70 to 90 feet. An understory of hardwoods has become established with trees ranging in size from seedlings to trees 3 inches in diameter.

The studies on the Clark State Forest also show that during the past 17 years Virginia pine has invaded areas where it formerly did not occur. It is now found invading many of the old hardwood planting areas such as the 1913 sycamore plantation. On other areas where other species of pine have been planted and a fair to good stand has become established, Virginia pine is also invading those plantations. An example is tract 119 where a mixture of 6 pines and black locust were planted in 1937. In this plantation Virginia pine has seeded in naturally and in some places has outgrown the planted pines. On the eroded portions where black locust was planted but which has not grown very well, Virginia pine has come in the more open areas and there it is growing very rapidly.

On some portions of the forest newly established Virginia pine consists of seedlings 4 to 30 inches in height and numbering from 15 to 25 thousand per acre. Other areas support scattered trees of seed bearing size and as the hardwood stands thin out seedlings of pine became established.

The characteristics which have been described for Virginia pine on the Clark State Forest are also applicable to the species when found growing in other parts of Indiana. It exhibits the same aggressiveness in invading abandoned fields and its growth habits are like those that have been described.

From the studies of Virginia pine on the Clark State Forest and supplemented by investigations covering other portions of Indiana, it is apparent that during the past few decades the range of Virginia pine has been extended. The species has the following characteristics:

1. It is an aggressive species and establishes itself easily from self sown seed.
2. It is an early seed producer with 5-year old trees producing good cone crops.

3. It is a rapid grower compared to other pines that are used for reforestation purposes.

4. It has reached its best development on portions of the Clark State Forest, where it has grown very well in mixture with native hardwoods.