

### Rotation.

By the rotation age is meant the number of years elapsing between the initiation of the stand and the harvesting of the mature crop of timber. Its length varies with the speed of growth of different species, with the market demands for different sized timber.

Softwoods as a rule are quicker growing than hardwoods. White Pine, for example, should be managed on 40-50 year rotation, as against 80-100 for Red Spruce. A demand for box boards, for example, will presuppose shorter rotation than for lumber and timber. The factor of expense varies the rotation in proportion to the interest charges on the investment expenses. It is to be remembered that moneys invested in timber production earn no return until the final harvest. While the initial investment may be comparatively small, its value increases greatly due to its increment at compound interest. This period should be fixed at a period when the yield possible in a given time shows the greatest margin of profit over the anticipated compounded expenses.

### The Financial Returns.

It is assumed that county forests will be coniferous. However, this need not necessarily be so. A good healthy hardwood forest already well developed on the ground, the species of which are well adapted to the soil climate and local market demands, may be taken and managed to a profitable return. Such a forest as this managed on a basis of continuous forest production is capable of producing an annual growth equal to 300 board feet of wood material per acre per year, yielding a net return of between \$3.00 to \$5.00 per acre per year.

On the whole, however, generally speaking on the same site, softwoods (planted white or red pine) will yield a better return than hardwoods. Hence, any forest management will tend to develop the highest possibilities of the site and will hence seek the development of softwood coniferous forest rather than a hardwoods forest.

Consequently it seems best to make any estimate of the financial returns to be expected from a public forest under management on this basis.

In the following calculation the interest rate of 5% has arbitrarily been established. It is not too low. In fact is rather high. Inasmuch as Victory Bonds were issued at from 3½ to 4½%, the adoption of this rate seems well justified.



A planted forest will begin to show results in a very short time. This picture shows a planted forest of Scotch Pine and Norway Spruce. The trees were planted in 1908 and 15 years later showed a height growth of from 20 to 25 ft.

### Basis of Calculation.

Cost of establishing plantation . . . . .	\$15.00 per acre
Additional work in clearing and freeing pine . . . . .	1.00 per acre
Protection and administration, annually . . . . .	0.20 per acre
Rate of interest used . . . . .	5%
Age at which timber should be cut . . . . .	40 years

Yield in Lumber at 40 years—	
White Pine 28,000 per b.f. per acre at \$20.00 per M . . . . .	\$560.00
Red and White Pine, equal mixed, 25,000 b.f. per acre at \$20.00 per M . . . . .	500.00

### Results

<i>White Pine Plantation</i>	
Value of timber at 40 years.	\$560.00
Expenses accumulated at 5% Compound interest to the 40th year. . . . .	\$150.00
Net profit in excess of all expenses . . . . .	410.00
	\$560.00 \$560.00

Net profit on the investment approximately 8%.

<i>Red and White Pine Plantation</i>	
Value of timber at 40 years. . .	\$500.00
Value of compound expenses . . . . .	\$135.00
Net profit . . . . .	365.00
	500.00 500.00

Net profit on the investment approximately 7.6%.

In the foregoing calculation two items, usually included in such calculation, have been omitted, namely, the value of the land, and the taxes on the land. This omission is justified by the assumption that such land used for public forest is valuable for no other purposes and has been accepted by the municipality in lieu of taxes, evidence of its lack of value. Inasmuch as it is a public forest, it will not be required to pay taxes.

Where bare land is purchased for purposes of plenty or reforestation, prices from \$5 to \$15 are justified and at such price the investment will yield a net return of from 5 to 6%.

The public forest fundamentally is an economic proposition and as such is capable of yielding a financial return to its owner, the municipality. The benefit of such a forest to the community is without question. Not only is there given a protection of watersheds, of stream flow, of drinking water, not only is there given to the people of the community opportunities for healthful recreation, but these forests can be so managed that there is return annually from the well managed to the treasury of the municipality, definite cash revenue, the amount of which is in direct proportion to the amount of forest under management, which returns can be directly apportioned to the lessening of the tax burden upon the individual citizen or the direct improvement of the community as a whole.