TREES AND EROSION CONTROL*

by

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On denuded lands where advanced erosion is evident, nature must be aided. Our greatest efforts must be spent upon such areas; they are a challenge to the forester. His problem is to select and plant tree species which will give maximum benefit in the shortest time. This problem is as important as the problems of the other specialists engaged in soil conservation. This reforestation or afforestation problem can be better approached by asking the question, what species of trees can be planted in any given locality which will result in the greatest benefits in the shortest time?

In order to answer this question, it is first necessary to obtain the answers to many other questions concerning the silvical and other values of a species, such as;

Climatic and site requirements
Probable influence of insects, disease, animals
Growth rate
Type of crown
Kind and amount of litter
Root system
Reproductive habit
Type of planting required and cost
Economic value of wood or products
Aesthetic, recreational, and game value

Climate and Site

The first question is obviously of greatest importance. Regardless of how effective any species may be in its natural habitat, its use is limited if it lacks the inherent capacity to establish and adapt itself to other environmental conditions. The fact that it can exist under other conditions is not sufficient. In making selections, therefore, climatic requirements must be met. Seed source is very important.

Insects, Disease, Animals

Some species of forest trees normally are attacked by some insects or diseases. For this reason, such species may have limited use or may require more careful treatment for establishing successful plantations. Rodents may be a more serious problem on some areas or with certain species. Regardless of how desirable a species may be because of its rapid growth, dense crown, and abundant litter, it should not be planted if it cannot be successfully established on the site with reasonable assurance of permanence. At times the action of insects or animals may be beneficial. The work of the white pine weevil produces a dense spreading crown and consequently increases the amount of point of injury. Such sprout clumps in vegetative density, one of the objectives sought.

Growth Rate

Rapid growth is desirable because, things being equal, it reflects the time spent in attaining the major objectives. Slow growing species, the same objectives be attained through closer planting. Therefore, species mally vary in growth rate even under the favorable site conditions. Vigorous and growth during the first five or ten years of utmost importance. Obtaining a complete crown cover is more important than height.

MECHANICAL AND BIOTIC FACTORS

Vegetation, whether tree, shrub, weed, or grass, functions in four ways to impede movement. The aerial parts, the litter, the roots act mechanically. In addition, influence that a particular species has associated species may control their vegetation density. In an attempt to obtain data on mechanical and biotic factors, a series of studies was begun, the results of which comparative values to a number of the important forest trees for erosion plant

The Aerial Parts

A vegetative roof reduces the erosive effect of beating rains. Leaves, branches, and stems obstruct the falling water and break the large drops into smaller ones which reach the soil deprived of their velocity and mass. A considerable amount of water is held by crowns. In dense stands, little or no water reaches the soil during moderate rains. Dryness and form influence the amount of water falling on crowns which have an unbranching habit tends to collect and run the twigs and limbs to the trunk, and then down the trunk to the soil. Thus the erosive effect of heavy rains is greatly reduced or checked by the aerial parts of the tree. In evaluating species this is a factor to be weighed. It is visually apparent that variations in crown density prevail not only among species but also in any species at different ages. The greatest difference is between deciduous and non-deciduous species of the conifers retain their foliage through the winter, and thus render year-round service. Many hardwoods leaf out late in the spring and shed their foliage early in the fall.