Silviculture similar to vegetable gardening

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IVERSITY PARK - Silviculture is the art and e of growing trees. An analogy can easily be drawn en silviculture and a vegetable garden. When a n is planted, weeded, and thinned, one can expect to t a good crop, provided the plants receive adequate ure and are protected from disease and insects. But ables planted in the wrong site, forced to compete weeds, or left in crowded rows will not produce r crops.

est, like gardens, need to be weeded and thinned in to produce good crops of timber and water. In time, e will do the weeding and thinning, but often we do ve the time or patience to wait.

ough the years foresters have learned how in- ual trees and other organisms interact to influence nother's growth. They have studied tree species and mined specific requirements for growth. This study e requirements is called "silvics." Silvics has fied several needs which influence a plant's ability ive and grow. Light, water, and nutrients are ry regulators of a species' competitive ability.

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eful observation reveals that certain species are in particular locations within a stand. For instance, ock frequently occurs on north facing slopes or along n banks in coves, but is seldom seen on south facing . Hemlock grows best on these sites because of dant moisture. It does not grow well on dry areas. ock has a wide-spreading shallow root system ing moisture near the soil surface.

mlock frequently occurs in nearly pure stands- gs or areas that contain essentially nothing but ocks. Hemlock's tolerance to shading is the reason his characteristic. Hemlock forms a very dense gy and allows very little light to reach a forest floor. species that can grow under very heavy shade will ve, and hemlock can survive in heavy shade. Consequently, hemlock seedlings will become established in the shade of the parent tree. They will survive, grow, and replace older hemlocks (when the older hemlocks die). Hemlock is classified as a climax species because once it fully occupies a site, it will continue to dominate the site and exclude other species. Species composition of a climax forest will persist until either a natural disturbance or man alters the stand.

Another example of a species influenced by moisture is chestnut oak (rock oak). This species is most often found on dry ridge sites. It grows on more moist sites, but is unable to compete successfully for light against species such as hemlock. As a result, chestnut oak grows where other species cannot find sufficient moisture.

It soon becomes evident that light and moisture can limit successful growth of any species. Foresters have studied the natural occurrence and growth rates of species and have constructed charts of relative tolerance to shade. These charts are used to explain why trees occur where they do within a forest and to understand their vigor.

A list of relative tolerance to shade follows:

Very Tolerant - Eastern Hemlock, Beech, Sugar Maple, Basswood, Hop Hornbeam.

Tolerant - Red Maple, Silver Maples, Yellow Birch.

Intermediate - E. White Pine, Elm, Amer. Hornbeam.

Intolerant - Black Cherry, White Ash, Yellow Poplar, White Oak, Red Oak, Hickory.

Very Intolerant - Paper Birch, Black Locust, Aspen, Larch.

Tolerance within a species is recognized by a number of characteristics. Tolerant species such as hemlock or beech persist in a forest understory. They respond to release from competition for light and moisture with accelerated growth and improved vigor, even after being suppressed for many years.

Under the same competitive conditions, lower branches of intolerant species usually die and break off many years earlier than those of tolerant species. This natural process is called self-pruning. Crowns of shade tolerant species have a denser appearance, and more leaf layers than do intolerant species, because lower branches remain alive much longer than those of intolerant trees. As a result, tolerant species frequently are slow to self-prune. They also tend to have more taper in the sawlog portion of their boles (trunks) in order to support their crowns.

Within mixed stands, tolerant trees persist and compete very well with species of equal size. Consequently, they tend to form stands that are dense, with more stems per acre than stands of intolerant species.

In even-age situations, such as occur after fires or clear cuts, tolerant species are quickly overtopped by faster-growing intolerant species. The tolerant trees will persist until the intolerant species is removed. The tolerants will then dominate the stand.

However, in a situation where both tolerant and intolerant trees are being established under an existing canopy, tolerant trees will dominate from the start. Because tolerant species prosper under shaded conditions they eventually become a major stand component, regardless of circumstances leading to stand regeneration.

The chart of relative tolerances shows that some of our more valuable species are found among intolerant species (black cherry, yellow poplar, white oak). These intolerant species have growth characteristics that make their wood valuable. Stands of intolerant species often have widely spaced stems, thus promoting rapid growth in height and diameter of each tree.

Crowns on intolerant trees will be small, resulting in relatively little log taper. Intolerant species in properly stocked stands will self-prune quickly, yielding high quality lumber with few knots.

Various species compete for a position within a developing stand. Left to nature, this competition can leave a lot to chance. Timber Stand Improvement (TSI) Practices shorten the time required to develop desirable forests. One common set of TSI practices is intermediate harvest cuttings.

TSI practices include weedings (of inferior trees and tree species), thinning (so that growth within the stand

[Continued on Page 38]