

 UI Extension Forestry Information Series

Silvicultural Decisions I: Planting vs. Natural Seeding

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The opportunity or need to replace (regenerate) an existing forest or start a new forest begins with the decision to use natural regeneration (seeding from vicinity trees) or artificial regeneration (planting). There are other natural and artificial regeneration methods but they are rarely used.

Planting. Planting provides the greatest opportunities for genetic improvement if seedlings are produced from parent trees of known superiority. Improvements in genetic quality can be for growth, insect or disease resistance, form, wood quality, frost or drought resistance, or many other characteristics. Planting also lets you change species from those currently in the natural stand. Past logging practices or natural disturbances can greatly alter the species present at regeneration time. These species may not be desirable for natural seeding for ecological or economical reasons.

Planting imposes fewer restrictions on harvest methods, equipment, and timing. The harvest can be planned to occur in any year and the seedling availability can be scheduled to coincide. In contrast, natural seeding success depends on harvest activities that coincide with a good seed year and that provide specific seedbed conditions.

Insects, rodents, birds, or diseases affect both natural seeding and planting. In addition, big-game, cattle, and human error can be serious problems with planted trees. These problems are compounded with planting because the investment is so much more than with natural regeneration.

Planting is a very complex activity. It begins long before the seedlings go into the ground and ends only after several years of maintenance during establishment. There are many opportunities for failure during

seed collection, nursery production, shipping, storage, field handling, planting, and maintenance. Nevertheless, planting is a more certain alternative for regenerating a forest and is the only method available in some situations.

Planting is favored on the best forest sites where future returns can justify the investment, or on any site where social values justify the costs beyond the value of the timber products. Social values include the development or improvement of wildlife habitat, mitigating visual impacts, and conservation plantings to control erosion and improve water quality.

Planting is also favored where the natural seed source is inadequate due to poor cone crops, infected seed, poor genetic quality, or lack of desired tree species. Current species composition can be unsuitable for the site due to natural causes as well as to past human activities or exploitation. Planting can be used successfully on the most severe sites but the investment may not be justified economically and the risk of failure is great.

Past plantings, especially those during the 60's and 70's, are not indicative of planting success today. Most planting failures were on difficult sites that did not naturally regenerate and were already occupied by other competing vegetation. Today, we better understand how to plant successfully, have better nursery technology, selected seed sources, genetically improved stock, and more sophisticated vegetation management techniques including selective herbicides.

Natural Regeneration. Natural regeneration through seeding from vicinity trees requires very specific conditions for success. Some species require exposed

mineral soil. Others are equally or more successful on less disturbed sites. Seedbed requirements must be present when seeds fall from the trees or the ever-present, opportunistic weed seeds or native shrub and herbaceous species will quickly claim the seedbed and thwart tree seeding.

Some genetic improvement is possible with natural seeding by carefully selecting parent trees left on the site. These trees are selected for their visual characteristics. We assume their apparent superiority will be expressed in the next generation.

Forest renewal by natural regeneration requires little initial investment compared to planting; however, there may be hidden costs. Successful natural seeding is rarely well-distributed over the site and will require pre-commercial thinning for good growth and form of potential crop trees.

Natural regeneration imposes severe restrictions on timber harvest because harvest methods and timing activities are used to prepare the seedbed and must coincide with a good seed year. Most northwestern conifer species follow a regular pattern of good seed years at intervals that vary from nearly every year to as long as seven years. With the current emphasis on biodiversity, the problem is complicated when several species are left to re-seed the area and they have varying seed crops.

Natural regeneration is generally favored for multiple-use areas because clearings are small and mature trees are usually left on the site. With the advent of *New*, *Adaptive*, and *New Perspective* forestry, foresters may leave the mature parent trees rather than cut them in the traditional manner after the new seedlings are

established. The low costs of natural seeding are preferred on low productivity sites where regeneration success is not as economically important where non-timber values dominate.

Combining Natural and Planted Regeneration.

Large clearcuts are becoming less socially acceptable. Planting does not require a clearcut, and many plantings that begin with well-spaced trees are complicated by natural seeding anyway. Professional forest managers and woodland owners may want to consider combining natural and artificial methods to gain the advantages of each and mitigate the negative effects. With careful planning, natural regeneration from seed trees selected for form, species, and stability can be supplemented with planting to increase species diversity, introduce genetic improvements, and improve overall regeneration success. Many potential variations could help meet our increasingly complex expectations for forest lands in an economically and environmentally acceptable manner.

Foresters consider the time of timber harvest as a beginning. It provides an opportunity to have a hand in shaping the future forest. Landowners and professional land managers need to have all the information they can and understand the advantages and disadvantages of alternative strategies. Selecting the best regeneration strategy is a silvicultural decision that needs to be made before beginning any other activities that may limit your alternatives.

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