

## THE IMPORTANCE OF MATCHING FOREST TREE SEED SOURCE WITH REFORESTATION SITE

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Would you plant a rosebush on the top of a snow-clad mountain? Would you plant one at timberline where even the indigenous trees are valuable only for non-timber purposes? Or would you plant your rosebush in an environment where it has a good chance of normal growth?

Most foresters today would give the right answers to these questions. However, some continue to ignore the fact that early reforestation efforts in the northwest contain numerous instances of plantation failures due to moving seed into hostile environments. Foresters should look first in their own back yards to improve both growth rate and quality of the product, rather than use seed from non-local sources. John S. Boyce in "Forest Pathology" expressed this philosophy many years ago: "Provided that plantations are established on suitable sites, of species adapted to the locality, with stock grown from seed from the proper locality and from thrifty mother trees, . . . , then such plantations should develop almost as well as naturally reproduced stands." We now know that if seed is collected from the best mother trees and the other criteria are observed, plantations should develop better than naturally reproduced stands.

There are still sane questions concerning the distance that seed can be moved. In regions such as the mountainous west, host studies and plantation results indicate that seed should be returned to the zone from which it was collected. Natural distribution of species raises sane warning flags. For example, why does the Coast Redwood in Oregon only thrive in the headwaters of the Smith River drainage? Why does Douglas fir, a species which grows from Canada to Mexico, give way to other species at about 4,000 feet in Oregon? Planting these valuable species outside of their natural ranges obviously results in reduced yield or complete failure. We know that moving seed within natural ranges often results in reduced yields. The recent results reported by Bob Campbell of the U.S. Forest Service in Corvallis, Oregon, indicates significant differences in early growth response when seed was moved from an east to a west aspect, at the same elevation, only 5 miles away. At the other extreme, early unpublished results from a current study indicate that Douglas fir in the Idaho region can be moved considerable distances with no loss in yield.

A study of altitudinal variation of ponderosa pine in California required 20 years to prove that high altitude sources were best adapted at high elevation (6,900). Once the lager elevation trees were exposed above the winter snows, they were damaged by the snow.

In view of all studies and personal observations of many western plantations, I am convinced that to avoid loss in yield, all seed used should be from local stands and from the most desirable trees within those stands. Only if trials have proved that other sources of seed can produce greater quantities of better quality products, should this policy be ignored.

As the coupe de grace, I trust you all know that species from much of the forested areas on this earth have been planted in the U.S.A. Where ' planted in competition with indigenous conifers, no exotic has outproduced local species.

In this day of worrying about narrowing gene pools, I would like to leave sane food for thought. During the last glacial period about 10,000 years ago, the ice cap covered the lowlands of the Olympic Peninsula. This meant that all Douglas-fir in Canada and on the Olympic Peninsula ceased to exist. As the ice retreated, Douglas-fir migrated northwards. Some of the highest yielding stands known are found in the reoccupied areas of Washington and Canada.

Today harvested trees are being replaced on National Forest and much other land with artificial, natural, or both types of reforestation. Man is trying to preserve genes from individual trees which have proved compatible with all local environmental factors. Meanwhile, un-cut scattered trees will continue to reproduce themselves. As I look ahead, I cannot be concerned over a possible reduction of gene pools for species which have occupied large acreages for years.

I have 4 slides to illustrate the need for matching seed source with reforestation site.

The first slide shows a plantation of 6 year old Big Trees (Sequoiadendron Gigantium) growing at about 3,000 feet on the Rogue River National Forest north of Medford. The seed came from near Placerville, California, over 300 miles south. Frost has repeatedly damaged most of these trees so that the plantation is a failure.

In slide two off-site Douglas-fir was planted on a ridge top in the Yacolt Burn of the Gifford Pinchot National Forest in Washington. After 30 years, few trees are alive. Trees from the same seed source were used to plant from the ridge top down 1,500 feet (elevation) to the valley. In the lower 500-800 feet performance is acceptable although not outstanding.

Slide 3 is a 40 year old ponderosa pine plantation on the Siskiyou National Forest in south west Oregon. The yield has been nil yet nearby natural reproduction the same age is 80-100 feet tall. The tallest measured ponderosa, 256 feet tall, grows about a mile away. The seed came from the Deschutes National Forest, about 200 miles away on the east slope of the Cascade mountains. Rainfall at source: 20-25 inches. Rainfall at plantation: 60 inches. Temperatures are much milder at the plantation.

The last slide is of a natural ponderosa pine on the Eldorado National Forest near Placerville, California. By using the proper seed source, today's foresters have the knowledge and opportunity for establishing plantations with many such trees.