TOP CLIPPING LOBLOLLY PINE SEEDLINGS TN VIRGINIA

By Tom Dierauf

Why and When We Got Interested In Top Clipping

We started research on top clipping in 1971. We were concerned about the large numbers of "out-of-balance" seedlings we were producing that had tall spindly tops and relatively small root systems. Our bed densities at the time were very high by today's standards, usually ranging from 40 to 50 per square. foot where the seed germinated well, and this resulted in. a lot of spindly seedlings. Over the past 20 years, we have installed 15 different studies including top-clipping as a treatment.

Benefits of top clipping at our Nurseries

Top clipping has two main benefits for us:

1 More uniform seedlings are produced, with fewer undersize and oversize seedlings. When a seedling is clipped in Virginia, it takes about three weeks for new buds to form and height growth to resume. Diameter growth of clipped seedlings is reduced as well, resulting in a reduction in the numbers of oversize seedlings. life consider seedlings larger than 7/32 inch root collar diamter to be oversize. In several studies we have done comparing seedlings of different root collar diameter, the larger grade 1 seedlings have not survived quite as well as grade 2 seedlings. Considering that grade 1 seedlings are more expensive to handle and more difficult to hand-plant, we prefer to eliminate the largest of the grade 1 seedlings by top clipping.

Seedlings which are not clipped are helped by the reduction in competition from clipping taller, neighboring seedlings. They are able to make better diameter growth, so at the end of the season there are fewer undersize seedlings. Also, the smaller seedlings (above the minimum plantable diameter) in top-clipped beds are of better quality than the smaller seedlings in unclipped beds.

2. Top clipping gives us an improvement in survival. Survival improvement is greatest for early winter planting, however, we have also improved survival for spring planting in most of our studies.

Our Operational Top Clipping Procedure

We clip three times. The first clipping is done during the last week in July or the first week in August. The second and third clippings are made at 3 to 4 week intervals, with the third clipping usually done around mid September. We shoot for target heights of 6, 7, and 8 inches in the three clippings. The first clipping is the lightest, probably cutting an average of 10 percent, and

not over 20 percent of the seedlings. The second clipping is the heaviest, clipping on the average about 50 percent of the seedlings. The second clipping usually does not cut any of the seedlings clipped the first time, because they have not recovered and resumed height growth sufficiently to be clipped the second time. The third clipping is intermediate in the percentage of seedlings clipped, perhaps averaging about 30 percent. The third clipping hits slow-growing seedlings that have never been clipped, as well as reclipping most of the seedlings that were clipped the first time. Our estimate is that in an average year, at least 80 percent of the seedlings are clipped at least one time, but we always have a fairly substantial number of seedlings that never get tall enough to clip.

These percentages vary tremendously from place to place in the nursery, for any of the three clippings. This is especially true at our New Kent nursery, where we have shallow drainages where the seedlings make rapid height growth and broad ridges where they make much slower height growth. In rapidly growing areas, we sometimes clip half the seedlings in the first clipping and close to 100 percent of the seedlings after all three clippings. Conversely, on some of the rigdes, we may not clip any seedlings in the first clipping and less than a third of the seedlings after 3 Clippings.

By clipping three times, we hope to avoid severe or drastic clipping. For most seedlings, we are clipping less than three inches. Relatively few seedlings have as much as four inches cut off. The clipping is always done in succulent stem material, never in woody stem material.

Bed Density

Over the past 20 years, our bed density has come down from 40 to 50 per square foot to 25 to 30 per square foot. I think there is probably an interaction between top length, bed density, and field survival. Tall seedlings from low density beds should survive better than equally tall seedlings from high density beds. Thus I would speculate that our survival improvement from top clipping will become less as we reduce bed density, but we have never installed a study in which bed density was varied as a treatment.

Height Growth in the Field

In all of our clipping studies, we have measured height growth each year for the first three years following planting. After the first season, unclipped seedlings are always taller, but by the end of the third year, clipped seedlings are as tall as unclipped seedlings.

Multiple Leaders Resulting from Clipping

Our top clipping produces lots of seedlings with multiple leaders; short, succulent leaders, that have only primary needles when they are lifted for planting. Our experience is that after planting, one leader quickly assumes dominance, and we never get forks originating at the point of clipping. When

planted early in the winter, these succulent, multiple leaders frequently die back, but this has not caused any problems with survival, subsequent height growth, or apical dominance.

Advantages of Top Clipping Compared to Root Pruning in Virginia

1. From the studies we have done, top clipping reduces cull percent and root pruning increases cull percent. Top clipping is a "selectuve" treatment, in that only the seedlings which are growing too rapidly are clipped and slowed down. The smaller, slower-growing seedlings are not clipped, and the reduction in competition from clipping their taller neighbors results in improved growth. Root pruning, on the other hand, reduces growth of all seedlings, including the smaller ones.

2. Field survival, in our studies, has been improved much more by top-clipping than by root pruning.

3. Top clipping is a much faster and simpler procedure than root pruning, and the Nurseryman does not face the danger of seedlings wilting excessively before irrigation water can be applied.