

IMPROVED METHOD FOR NURSERY PRODUCTION OF QUAKING ASPEN SEEDLINGS

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An increasing interest in improved polyploid and hybrid aspen has demanded a method of producing large numbers of aspen seedlings at a minimum cost. Because aspen seed is very small, loses its viability rapidly, is subject to damping-off and mold, and is easily washed by raindrop action during the first few weeks of slow seedling growth, the techniques employed in the production of the larger seeded conifers cannot be used with aspen seed.

The present method of starting seeds on saucers in the greenhouse, transplanting the seedlings to plant bands, and finally transferring them into the field works well but involves much labor and greenhouse space. An earlier method described by Einspahr¹ was fairly successful but required special care to avoid the washing of seedlings and the accumulation of algae from excessive soil moisture.

Methods

In the winter of 1961 a preliminary trial, using saucers, was made to determine whether aspen seed actually must be on top of the soil to germinate and survive as was generally believed. It was felt that if the seed would still germinate and survive when covered, less washing of the seed would occur and the seed would require less watering. Covering would also allow the maintaining of a drier surface on the seedbeds and eliminate much of the mold and algae which tends to form on moist soil surfaces. The preliminary trial demonstrated that quaking aspen could be covered with as much as 1/8 inch of soil with little effect on germination and survival. With this new information, a technique that proved to be quite satisfactory was developed during the summer at The Institute of Paper Chemistry nursery.

In the spring of 1961 twenty-two beds were planted with seed from 21 controlled quaking aspen crosses. Each bed was 4 by 12 feet (fig. 1). The base was made of 2 by 4's. The housing protecting the bed in the early stages of growth had a galvanized screen across the top and this in turn was covered with a hinged frame upon which a watertight plastic covered screen was attached. A shading compound was used to reduce temperatures within the housing and the galvanized screen provided protection from raindrop action.

The bases were leveled and filled to within 9/16 of an inch of the top with nursery soil in which had been incorporated a slowly soluble fertilizer. The remaining 9/16 inch was filled with an acid (pH 4.5-5.0) sandy loam soil. The beds were then fumigated with methyl bromide at 1 pound per 100 square feet for 30 hours. After the 30-hour methyl bromide fumigation treatment, the seedbeds were aerated for 48 hours. Next the aspen seed was sown and covered with a fumigated acid sandy loam to a depth of 1/16-1/8 inch. The beds were watered manually for the first 8 to 10 days at which time the covers were raised during the day and the beds watered by an automatic overhead sprinkler. After about 30 days the hinged covers were removed and the beds were watered automatically.

¹ Einspahr, D. W. Nursery production of aspen seedlings. *Tree Planters' Notes* 35: 22-24. 1959.

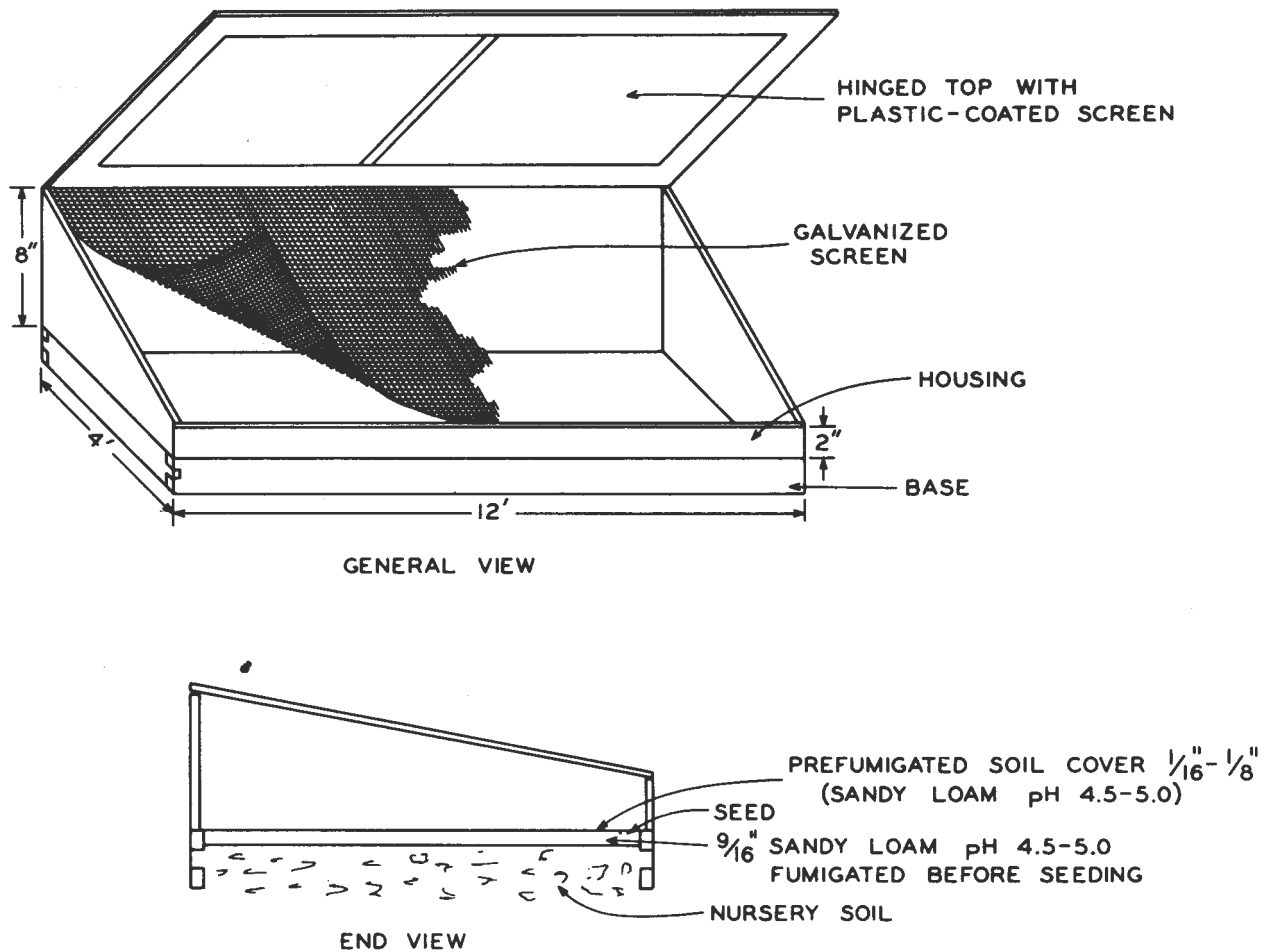


Figure 1.--A general view and end view of a single seedbed.

by the overhead sprinkler line. At 2 months the housing was removed completely to allow unobstructed height growth and the toughening-up of the seedlings.

Results

Using the seedbed techniques described above, approximately 5,000 aspen 1-0 seedlings suitable for field planting were produced (figs. 2 and 3). Seedbed densities were 10-14 seedlings per square foot and the average height of all seedlings at 120 days was 1.2 feet, with many individuals exceeding 3 feet in height. This technique works well with quaking aspen and alba x bigtooth hybrids. It can also be used with cottonwood but not as much detail in care and attention is necessary. It is worth noting that big tooth aspen treated in the same manner did not react as satisfactorily, but it is felt that some modifications in the technique will make large-scale production of bigtooth aspen seedlings possible.

This method of seedling production requires careful attention to details, but it is felt that if a large-scale method of producing quaking aspen seedlings is desired, this method is worthy of consideration.

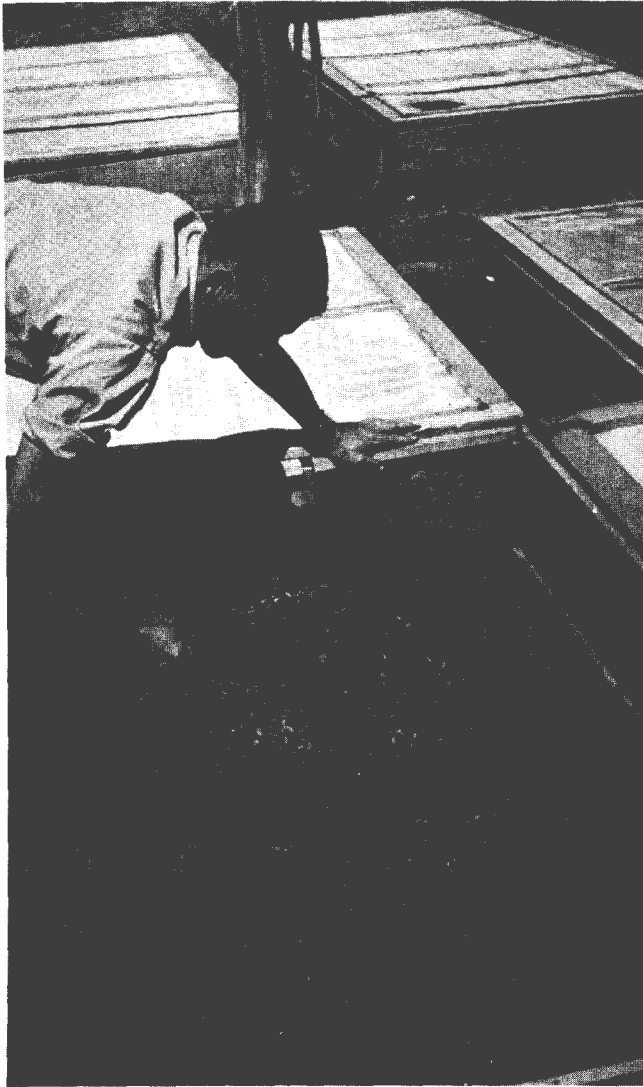


Figure 2.--Quaking aspen in seedbed at 16 days.

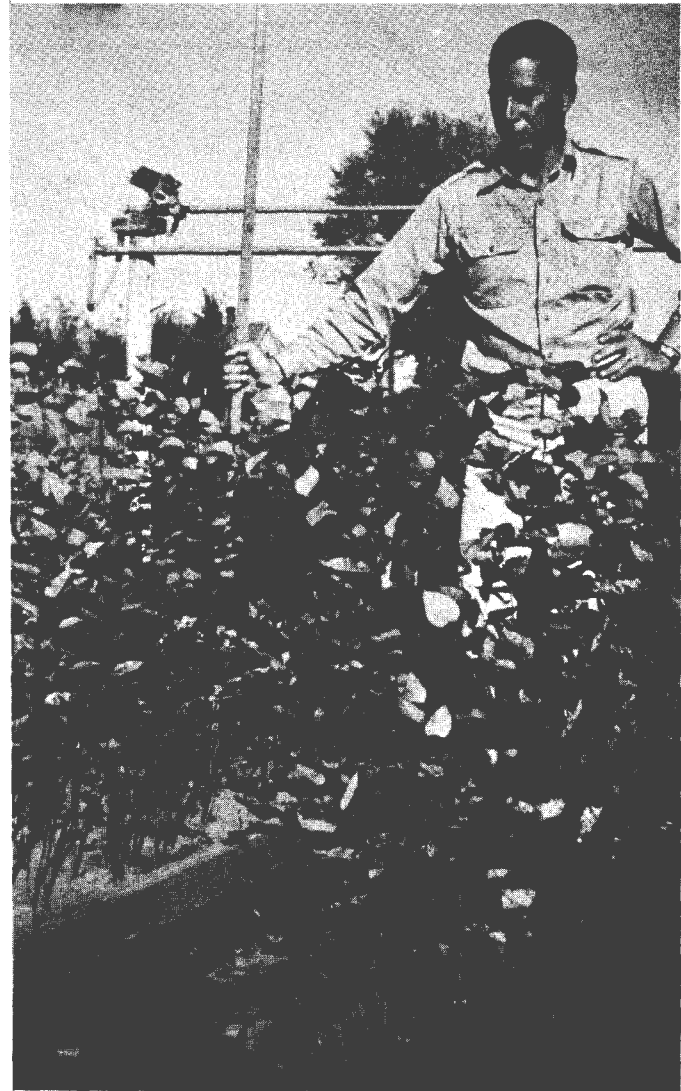


Figure 3.--Quaking aspen seedlings in seedbed at 120 days.
Hand is held on the measuring stick at 3 feet.