

NURSERY PRODUCTION OF ASPEN SEEDLINGS

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The introduction of improved aspen (Populus tremuloides and P. grandidentata), polyploid aspen and aspen hybrids, has increased interest in aspen, and made it desirable to work out a method in which large numbers of seedlings can be produced at reasonable cost.

Conventional nursery techniques, satisfactory for large-seeded species, are not suitable for aspen. Aspen seed is extremely small, loses viability rapidly, is susceptible to damping-off and mold damage, is slow growing when small, and can easily be washed from the soil during early growth by raindrop action. These characteristics make development of special handling methods desirable.

Most tree improvement programs working with aspen in the United States and Europe use a method similar to the system described by K. R. Shea and J. E. Kuntz (1956)¹. Satisfactory germination and survival can be obtained in the greenhouse by planting the seed on small plots or flats using sterilized sand (pH 4 to 5) or sand and sphagnum moss mixtures. The germinating medium is kept moist the first 2 weeks, and when the seedlings are 1 to 2 inches tall, they are transplanted into plant bands, and when they reach a height of 5 to 8 inches, into the field. This has been a very satisfactory procedure for experimental material but does involve considerable labor and greenhouse space.

METHODS

A preliminary field trial made in the summer of 1956 indicated that suitable germination and survival could be obtained if the seed was started on sterilized acid sand, watered regularly, and the young seedlings protected from the washing action of rain.

Based on this preliminary trial, 11 seedbeds were established in the spring of 1957. The seedbeds were shaped up by using side boards (fig. 1), and nursery soil was fumigated with methyl bromide prior to the application of the sand-germinating medium. After fumigation, the surfaces of the beds were leveled and covered with a layer of acid sand (pH 4.5 to 5.0). The sand-germinating medium in five of the seedbeds was sterilized in an autoclave (15 pounds, 45-minutes) prior to application. Untreated sand was used in the remainder of the seedbeds. In six of the beds, water was provided by a gravity system employing a muslin-wrapped, rigid plastic soaker hose running down the middle, and in the remaining 5 beds, water was applied manually by spraying the beds periodically with a fine spray nozzle attached to a garden hose.

1 Shea, K. R., and Kuntz, J. E. Prevention of damping-off of poplar seedlings. Forest Sci. 2:514-57. 1956.

The beds were 12 feet long and 2 feet wide, and a plastic-covered screen protected the seedlings from raindrop action. Daily watering was required when the days were sunny, and after the covering frames were removed in early July, watering was required about twice a week. Soluble fertilizer was applied each week after the seedlings reached a height of 1 to 2 inches.

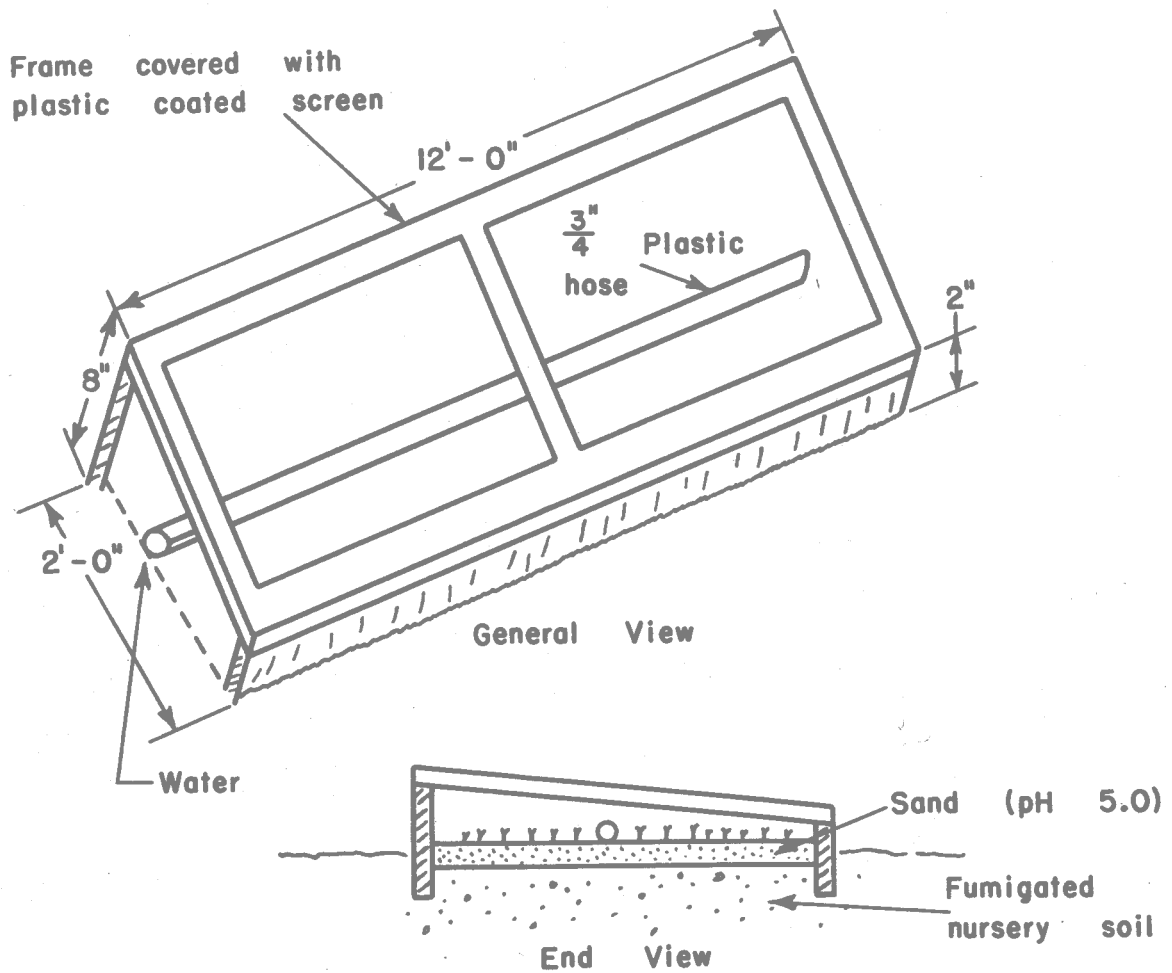


Figure 1. General view and end view of an aspen broadcast seedbed.

RESULTS

Observations on growth and survival indicate that seedlings suitable for field planting can be produced in one season by the above, described method. Seedbed densities ranged from 15 to 20 trees per square foot, and seedling heights varied from 12 to 18 inches for quaking aspen and 14 to 20 inches for bigtooth aspen (fig. 2). Further observation in this trial indicates that sterilization of the germinating medium is required for bigtooth aspen. For quaking aspen, sterilization gives satisfactory results but does not appear to be absolutely necessary.

Manual watering with a fine spray and the use of a soaker hose were the two watering methods employed. The results obtained indicate that manual watering is superior. Although the time required was a little greater, the fine spray method resulted in more uniform germination and growth.

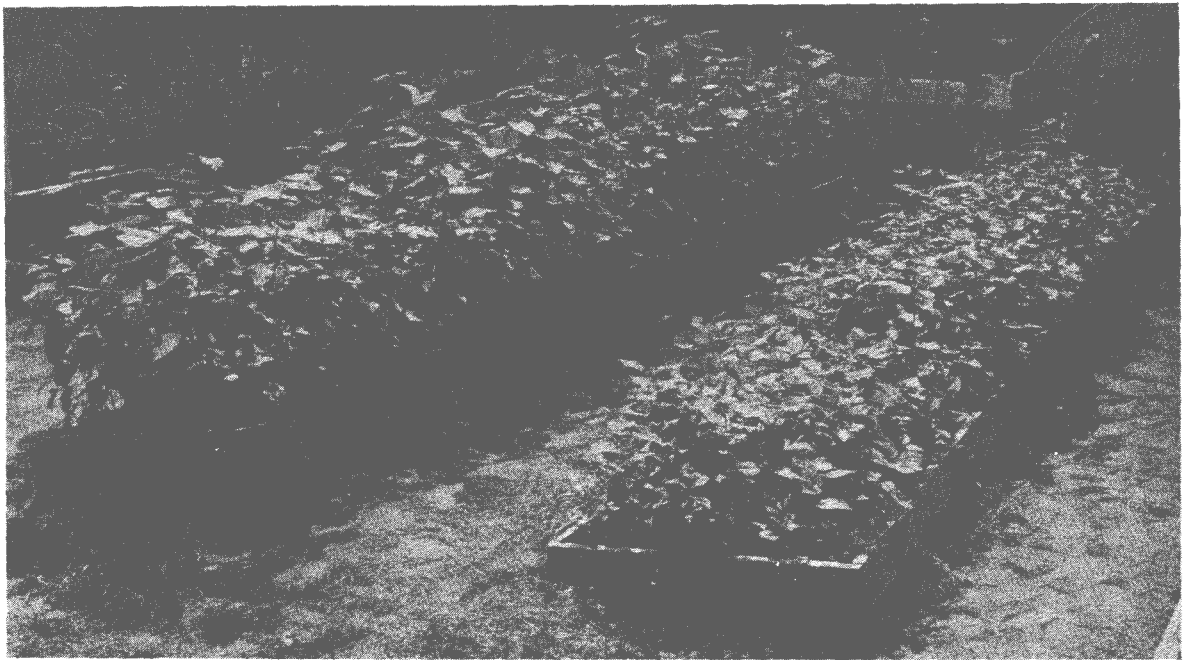


Figure 2. Seedlings: left, bigtooth aspen; right, quaking aspen; growing in broadcast seedbeds in late August.