

## AIRDROP DELIVERY OF PLANTING STOCK

by

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Widely separated planting sites at high elevations in the Rocky Mountains Colorado have presented serious storage and transportation problems. Planting stock grown at low elevation nurseries for high elevation planting must be stored periods of up to ninety days, because of the difference in growing seasons between the planting site and the nursery. Efforts to grow nursery stock near the planting sites at various locations in the Rocky Mountains between 7,300 and 11,000 feet elevation have been disappointing.

Through the years, pre-planting storage has been accomplished by burying planting stock in snowbanks near the planting sites. This system has been and leaves something to be desired in proper handling of planting stock. Refrigerated storage has been provided at the nurseries; however this has resulted in high transportation costs due to the need for frequent trips between planting sites and nurseries.

In the Rocky Mountain Region we have improved our stock handling procedures by providing optimum storage conditions at the nursery and making daily deliveries by air from the nursery to the planting site. The trees are baled and strapped to a vertical pallet. (Slides used in connection with this paper will show details of packaging.) Chutes are attached to the packages at the nursery or airport, The packages and chutes are delivered to an airport near the nursery for loading on the airplane,

Our 1965 airdrop program involved three National Forests and nineteen drop spots. The Region delivered 3,000 M trees direct to the planting sites by air, This required the coordinated efforts of the receiving Forests, Region 2 Nurseries, the Region's Air Operations Officer, and the Division of Timber Management.

The airdrop delivery was selected because of the excessive delivery time by ground methods and inefficient storage at the planting site. We found that most seedlings taken out of cold storage in the morning were planted within 24 hours on sites 100 to 300 miles distant.

The trees are dropped over a period of 2-1/2 months (spring planting season). Drops are generally made in the early morning hours. The quiet air at that time permits accurate drops and the fresh trees are ready for the planting crews.

Bundles of 4 to 6 thousand trees were attached to each cargo chute. Generally the entire load was delivered to one site, but split drops to two sites were made on occasion as the job required.

The plane, a twin-engine Beechcraft, carried an average of 40,000 trees on every load. Capacity of the plane varied from 30 M 2-1 ponderosa pine to

6 M 2-0 lodgepole pine. The average flight time was a little over two hours round trip at an average cost for plane hire of \$4.00 per M. Our larger program for 1966 cost somewhat less. Total cost, cold storage plant to planting site, this year, was about 54.50 per M.

A successful airdrop depends on:

1. Experienced pilot and trained cargo dropper.
2. Good ground targets.
3. Radio communication from ground to air at least on initial drop.
4. Prompt return of chutes and cargo bags.
5. 24-hour lead time on request for drop.
6. Planting crew large enough to handle a full load without excessive carryover.
7. Central dispatching officer.

Receiving units are well pleased with the service to date. Our Regional average cost of planting for 1965 was \$8 per acre less than that for 1964. Between \$4 and \$5 of this reduction was due to the air delivery system. A further reduction in planting cost was experienced in 1965 and still less in 1966. Perhaps of more importance is the fact that the trees arrive at the planting site in excellent condition.