WEYERHAEUSER TREE SEEDLING HARVESTER SYSTEMS

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Weyerhaeuser Company has several large nurseries in Northwest and Southern United States. Increasing labor costs at these nurseries has forced the development of automated harvesting systems. This development work has been proceeding at the Longview, Washington, Technical Center, for over 2 years. For partial results of this work, see figures 1, 2, 3, and 4.

Machines for 2-year-old seedlings planted on 6-inch centers and for transplanted 3-year-old seedlings planted on 10-inch centers have been designed and built.

These harvesting machines operate by fluidizing the soil around the seedlings by vibration, then lifting the seedlings from the ground with soft belts. Lifted seedlings are then transferred to a variety of transporting systems. Although minimum labor is required, careful design of these systems has allowed the use of standard packing shed facilities.

Performance of the basic harvesting machines during the 1969-70 harvesting season has been impressive. These machines have shown that

1. Seedlings can be pulled from almost any soil, including very wet heavy clays.
2. By using machines, seedling root damage is less than when roots are hand pulled.
3. Machine capital costs are reclaimed through labor savings when approximately 5 million seedlings have been harvested; i.e., working on a 2 1/2 million seedling nursery, a machine will pay for itself in about 2 years.
4. Soil removal in most soils is excellent.
5. Complete seedling harvesting systems from bed to packing shed are possible using only five men.
6. Design reliability is 99+ percent.
7. Machine speed, elevation, and steering can be hydraulically controlled for field conditions.
8. Rain does not usually decrease machine performance.
9. Small (4 inch) to larger (over 24 inch) seedlings can be pulled. Sometimes undersized seedlings can be automatically culled.

What does the future hold? Recent advances in harvester and support equipment technology now form a base from which self-propelled designs can be built. Further design advances are difficult to predict until present packing, grading, and culling techniques are improved. Until then, automated transporting systems will probably be custom built to fit existing packing techniques, while semistandard harvester designs are used to pull the seedlings from the ground.

Figure 1.—Eight row seedling harvester with trailing conveyor and stretcher packing system. Pulled with Ford 5000 tractor.

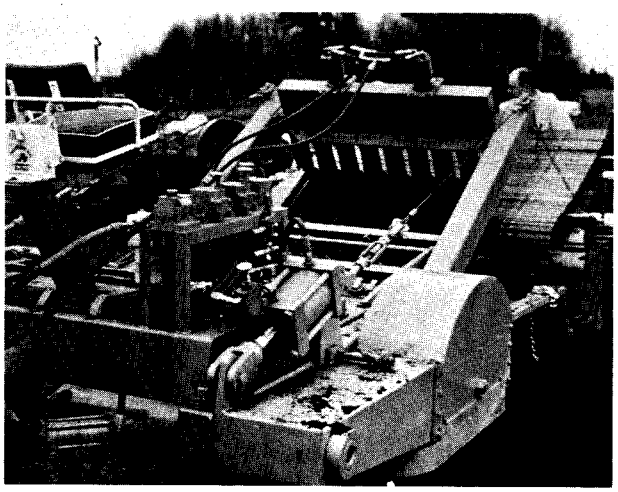

Figure 2.—Pulled and cleaned seedlings as deposited on rear conveyor. Both rear or side conveyors leave seedlings conveniently orientated for packing.

Figure 3.—Rear view of basic harvesting machine without conveyors. Adjustable machine, elevated permits skipping unharvested seedlings.

Figure 4.—Seedlings being packed in stretcher system for transportation to packing shed. Standard boxing transportation systems may also be used.

HAVE YOU SEEN THESE?

A Seed Orchardist's Guide to the Handling of In secticides and the Calibration of Spray equipment. Gary L. DeBarr and Edward P. Merkel-October 1969-Southeastern Forest Experiment Station, Asheville, N. C.

A handy guide booklet which summarizes the principals of insecticide applications, emphasizes safe handling methods and presents formulation mixing instructions, and calibrating methods. 16p. It is free upon request.

Thermal Properties and Surface Temperatures of Seedbeds.

1969 P. H. Cochran-Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. A technical paper dealing with factors of the environment (slope, aspect, shade, soil water content, evaporation rates, wind, etc.) and how they interrelate to affect seed and seedling growth. 19p. Free

Identifying Juvenile Seedlings In Southern Hard wood Forests.

1969 Louis C. Maisenhelder-Southern Forest Experiment Station, New Orleans, Louisiana SO-47 A useful guide which all Eastern United States forest land managers should have available in their reference library. 3-4 photographs accompany each of the 68 species covered in the publication. 77p. Free

Nursery Diseases of Southern Pines.

1969 Charles S. Hodges, Jr., and John L. Ruehle-Forest Pest Leaflet 32.

Available from Southeast Forest Experiment Station, Asheville, N. C. A revised version of an earlier published leaflet.