MECHANIZATION IN FOREST NURSERIES[1/]

MECHANICAL HARVESTING--A CASE HISTORY

Sidney H. Hanks (Panel Moderator)
U.S. Forest Service, Upper Darby, Pennsylvania

I want to describe to you some impacts resulting from the introduction and use of a mechanical harvester into one nursery operation. These impacts will be much the same regardless of the breed of harvester used. This one (slide) happens to be the Grayco, which is an adaptation of a potato harvester to tree harvesting.

The five major impacts on this nursery system resulting from the introduction of this particular mechanical harvester were:

1. The requirement that seed be drill sown. Initially it was believed that this harvester would successfully harvest broadcast seedbeds as well as drill sown beds, but this has not been the case.

2. The requirement to root prune between drill rows. Lateral root pruning also contributed significantly to the productive efficiency of this machine.

3. The need to effectively handle larger volumes of seedlings. The high output of any harvester produces large volumes of seedlings, which in turn require more efficient seedling handling in the field. The solution in this case was the introduction of materials handling equipment.

4. The need to remove some additional soil at some point after field harvesting. (This is a variable requirement depending upon soil type and soil moisture conditions.) When the truck arrives at the processing center a second forklift unloads the boxes and either places them in storage for later processing or places them in front of a shaker conveyor. The seedlings are removed from the boxes by hand or by pitchfork and placed on the shaker conveyor which removes excess soil left by this harvester.

5. The need to deal with the root and top orientation problem. This results from lack of root and top orientation as the seedlings are packed in the pallet boxes in the field after leaving the shaker conveyor at the processing building. This impact has been surmounted through the use of feed conveyors which move the seedlings from the shaker to the people doing the counting and culling. The nursery built system of parallel conveyors, one to supply ungraded material

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1/ Panel presentation. Papers of panel participants are included.

and a second to move the counted and graded material to the bundle tiers, was developed and used quite successfully.

These five impacts were solved, resulting in a saving of $1.11 per M which paid for the machinery and alternations in the first year's operation. Six men handled the harvesting and transportation of seedlings from the field to the processing center. Average daily production was 400 thousand seedlings per day.

The root and top orientation impact created by this particular harvester is a source of concern to anyone experienced in nursery operations. The steps taken at this nursery to minimize this effect were successful as evidenced by an average count per person involved in the counting and packaging operation of 11 thousand seedlings per person per day. Output averaged 550 thousand seedlings daily.

Thus, impacts created by mechanical seedling harvesting can be solved without sacrifice in seedling quality and with a savings in operation costs.