

## Mechanization in Bareroot Shade and Fruit Tree Production

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There are numerous methods of improving production efficiency in a nursery operation. Some areas for consideration are: job training, employee motivation, quality control, production scheduling, improved working conditions, and mechanization of labor intensive activities. At Carlton Plants, mechanization has been an important factor in keeping up with the demands of a rapidly expanding production schedule.

Motivation for a program of mechanization comes in the form of savings through: 1) a reduction in the labor required to do an activity, 2) reduced exposure of employees to potential injury, 3) better utilization of existing equipment, 4) fuel conservation, and 5) lower payroll costs. Even with these incentives, mechanization must become a priority to the nursery person in order for the program to be successful. This is to say that one must be conscious of the opportunity for improving by changing methods through mechanization.

The process starts by challenging activities and asking: is there a better, faster, easier, and safer way that they can be performed? Analyze the situation to determine if an already existing piece of equipment can be expanded or improved upon. Key personnel, such as production supervisors, equipment operators, and the shop workers are very important to this process. Determine the advantages of mechanizing a process and what the gains will be. Then calculate the costs and probability of success of the project. Many good ideas are just not practical or cost effective—know when to say stop!

Don't get caught up in thinking that all ideas must be original. There are many creative people in the field of agriculture that have already developed machinery that can be adapted to your particular situation with some modification.

Sources for ideas can come from visits to competitors, horticulture and agricultural trade journals and machinery shows, such as the Northwest Ag. Show in Oregon and Tulare Ag. Show in California.

Over the years our employees have worked hard to improve production techniques through a variety of innovations. The following list will indicate the equipment, the job and what was accomplished by mechanization.

**Four Row Multi-Row Disc.** Used to loosen soil in spring after subsoiling of budded tree liners and second year shrubs—does four rows at a time, replacing single row rototillers on small tractors.

**Four Row Cultivator.** Used to cultivate soil during spring and summer for weed and moisture control—one operator and tractor replaces four one row units on tree and shrub liners.

**Befco Four Row Fertilizer Applicator.** Applies supplemental fertilizer to tree and shrub liners—replaces J D 650 tractor and John Blue one-row applicator.

**Helicopter Fertilizer Application.** A helicopter is utilized on a contract service basis to apply fertilizer to tree and shrub fields when the fields are too soft for equipment to operate. Three hundred acres can be done in one day.

**Hagie Multi-Row Sprayer.** A custom sprayer which can be utilized to treat all sizes of trees and shrubs, accomplishing up to eight rows at a time. This sprayer replaces a variety of other sprayers and can go into areas that other types of sprayer equipment cannot.

**Cat Two-Row Digger.** Used to harvest trees and shrubs two rows at a time. Reduces travel by people and equipment and speeds up harvest.

**Racked Planting Trailer.** These trailers are used to transport potted tree and shrub liners to the field for planting. Reduces the number of trips to the field by 50%.

**Corn Chopper for Rootstocks.** Used to chop and grind the tops of dormant rootstocks into chips—eliminates hand work of removing and disposing of unwanted brush.

**Pneumatic Air Pruners.** These pruners are used to cut off the stub of the rootstock at the bud. Operation is very rapid and easy on the hand of the operator.

**Gas-Powered Hedge Pruners.** These shears replace regular hedge shears to speed up the pruning of soft, dense foliage on field-grown shrubs.

**Subsoiler with Anchor Chain Drag.** The anchor chain drags behind the subsoiler to break down clods and smooth out the field to make it easier on the person plowing.

**Bobcat Tractor with Snowblower.** We use this unit to trench the saw-dust so trees can be heeled in for storage after harvest. This replaces a plow unit and lots of shoveling.

**Racking.** Portable racks are used to store trees and shrubs in coolers. They replace pallets and are much more efficient in the use of storage space.

**Honda Four-Trax with Trailer.** This set up is used to haul bulky, hardwood cuttings from the fields. This operation takes place in winter when fields are wet. One unit can replace 6 to 8 people and reduces chance for injury to workers.

These are just a few examples of how ideas can be converted into practical applications. One must be persistent in the approach to mechanization and each project, as there will be many failures along the way. The payoff, however, can be profitable and rewarding.

Mechanization is not just limited to large projects, many small applications are just as productive in their own way. However, mechanization has its costs. Machinery, parts and fabrication work can be very expensive, not to mention management time.