

Gizmos and Gadgets: Nursery Equipment for Greater Work Efficiency®

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INTRODUCTION

The focus of this presentation is to look at different nursery functions and pieces of equipment that have been developed by nurseries to improve their work efficiency. Most equipment, implements, and machinery used in the nursery industry have been modified to suite the needs of the different nurseries as they try to mechanize and become more efficient.

Inviro Mist Sprayers. These are used by many field nurseries to apply post-emergent herbicides. This sprayer system can be modified to fit almost any piece of equipment and multiple different options to apply pesticides to many different types of crops. It can replace applying post-emergent herbicides by backpack sprayers and is more efficient in both less man hours to apply as well as less chemical used with the unique spraying system.

Tiller/Packer. A tiller with an attached packing roller on the back can eliminate one pass of the equipment by not only tilling the seed bed (or any other raised bed) but packing the bed after the passing of the tiller making the bed ready to plant in one pass versus two passes.

Grading Belt. A grading belt is useful when grading large numbers of relatively small plants. A typical crop may have 4 or 5 sizes as well as culls (unsalable plants) that will be sorted, put into bundles and stored in cold storage. In the past all plants were put on a table and workers picked plants off the pile and sorted them into sizes. A greater efficiency can be achieved by loading onto the grading belt system and each worker only picks off a specific size allowing for a greater number of plants graded per man hour. The unsalable plants can go off the end of the conveyer belt into a trash receptacle thus eliminating the handling of those plants. When this new system was implemented the same size crew was able to grade twice the amount of plants compared to the previous system.

Pruning Table. The grading process of seedling trees can be more labor efficient by using a band saw mounted at the edge of a table top that turns to allow roots or tree tops to be pruned as an entire bundle at a time. This process is not only more efficient it is also safer for the grading workers.

Tree Staking. At a tree liner nursery this can be one of the largest labor-consuming functions. The traditional process had been to carry the steel stakes down the nursery row and place them in the isle between the rows at a spacing that coincides with the row spacing. The second crew would place the stakes next to the small trees by pushing them into the ground. This process made it very difficult not only to carry the heavy steel stakes down the rows, but to push the stakes into

the ground. The new process starts with the steel stakes being loaded onto a small trailer that is pulled by a tractor. This tractor also has a ripper/subsoiler mounted onto it that cuts a groove in the aisle between the tree rows for the stakes to be distributed down the row. The second crew comes through and picks the stakes from the aisle and places it next to the small tree. Instead of pushing the stakes in by hand, a tractor with an overhead boom with pneumatic drivers are used to drive each stake into the soil. To ensure consistent depth of each stake a gauge is used on each driver to drive to the proper depth. This process saves a great deal of labor as well as making the task less strenuous on the workers. An efficiency of 30–40% was gained by progressing to this new system.

Pot Tumbler. Most container nurseries are confronted with the issue of what to do with the pots that the plants have died in. Many state dumps will not take pots with soil in them, so to dispose of these pots of dead plants they are forced to dump the soil out of each pot before disposing of the pot. This is an extremely labor-intensive process just to get rid of dead or defective plants. The Pot Tumbler was designed to allow the process to be much more efficient as well as easier for the workers to perform the function. This process works with one worker loading pots into one end of the turning tumbler. The small baffles in the tumbler cause the pots to spin around inside of the slotted tumbler, knocking the soil out. The pots then empty come out the opposite end of the tumbler to fall into a receptacle. The soil comes out of the pot as it spins inside the tumbler and the soil falls through the slotted tumbler onto the ground below where it can be removed by a piece of equipment.

Dingo Tree Mover. Moving 95 L (25 gal) and larger-sized trees is strenuous work taking several workers to remove a tree from the growing pad and moving it to the shipping location. A labor-saving process was developed to be able to pull the containerized tree from the growing pad and move to the loading dock or load directly onto the customer's truck using only one worker. Not only is it more labor efficient, it has also reduced the potential of strained muscles and potential injury of workers.

Pneumatic Pruners. Functions such as cutting back newly budded trees where the cuts made are on thick trunks can be very labor inefficient and very physically demanding. Pneumatic pruners allows for a higher number of trees to be pruned per man hour, as well as less fatigue on the workers.

Budding Prep Blower. A tractor-mounted commercial blower was modified to remove the majority of the soil at the base of the trees in the preparation of the budding process. Previously this was all hand work with hand tools and considerably less labor efficient.

Cinch-Tying Machine. Grading bare-root trees and shrubs into bundles to be sold takes a considerable amount of labor in the process. The traditional process was for the bundle of plants to be put on a short rack where the bundles were tied by hand with string (or equivalent material). The process was streamlined by using a machine to tie the bundles in a swift process. Incorporating the cinch-tying machine has reduced fatigue on workers and is considerably more labor efficient. The crew size in the new process was reduced from 6 to 5 workers, and the production of processed plants increased from 3,000 to 4,500 plants per crew per day.

Layer Packer. The process of packing sawdust on layer beds has always been labor intensive. The sawdust is applied over top the stool beds by a machine much like a manure spreader that is calibrated to apply a pre-set amount of sawdust. The sawdust must then be settled in among the stems & branches as to not leaving any air pockets. A packing machine was developed in which the machine is able to pack the sawdust in around the branches leaving only final touch up for the crew to follow up behind to do.

Chopper Topper. These machines were developed to reduce the labor of pruning and handling of plants. The machines used to top-prune shrubs reduces the man hours when the crew comes in to finish the pruning by hand. The second “Topper” machine is used to reduce the tops of seedling trees that will be used for budding and grafting. These seedlings are grown in large numbers and by reducing the tops of the trees prior to harvest, the harvest time is reduced since there is less material to handle. Incorporating the chopper-topper system does not completely eliminate the labor man hours, but does reduce time spent harvesting thus making for a more efficient operation.

Solar-Powered Irrigation Line. A solar collector mounted on top of the irrigation motor powers the irrigation to move independently across the field. This solar unit can replace battery or gasoline motors to drive the unit.

Loading Harvested Plants. Loading harvested plants onto large wagons with one or two large custom-made pallets allows for quick unloading and storage of plants. One worker on a fork lift can unload and position an entire wagon load of plants in just a few minutes.

Skylights in Warehouses. By adding skylights into the roof of warehouses, electricity has been reduced by reducing the need to have the lights on any time someone enters the warehouse. Light also adds a positive environment in the workplace when workers have to spend long periods of time working in the building.

SUMMARY

In summary, the company culture at each nursery must be clear and point the direction the company wants to take. Different times set different priorities, but the message needs to be consistent that you need to continually evaluate priorities to deal with different skills, attitudes, and knowledge bases of your workers. This workforce should carry this mindset that efficiency must be a continual “work in progress” to get the most return from your investments.