

## Innovation in Tree Processing

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### INTRODUCTION

Baker's Nursery is a wholesale grower of ornamental deciduous trees and shrubs, cultivating 200,000 pieces of nursery stock, and harvesting and shipping over 25,000 trees and shrubs annually. The bulk of our production is shipped bareroot, without attached soil. Baker's Nursery ships fresh, no stock is retained in cold storage facilities. Trees and shrubs are harvested and shipped immediately during spring and fall digging periods. This restrictive processing schedule leaves us at the whim of nature necessitating an efficient and innovative system of harvesting and processing our nursery stock. The two components of this system, harvesting and processing, will be examined in terms of the modifications made to the equipment and facilities we use and the savings and benefits resulting from these modifications.

### HARVESTING PROCEDURES AND EQUIPMENT

Prior to our newest harvesting system, we employed five staff and two tractors to dig only 2000 pieces of nursery stock daily. Today we employ three staff and one tractor to harvest 5000 trees and shrubs daily consuming significantly fewer human and mechanical resources. These savings were accomplished with a few rudimentary and inexpensive modifications to our equipment. An 85-horsepower tractor equipped with a "creeper" gear is used to pull a mechanical shaker digger. To eliminate the need for another tractor and operator, the harvesting wagon was attached to the digging unit by simply welding a tongue directly to the mechanical shaker digger. By attaching the wagon to the harvesting unit, another employee who shuttled trees from the digger to the wagon became redundant. After experiencing the strenuous task of walking behind the mechanical shaker digger in the loose uneven dirt to gather dug stock, it became apparent that a platform also welded and bolted directly to the harvesting unit made sense in terms of safety and physical demands for employees. This harvesting system utilizes human and mechanical resources in this manner:

- One employee operates one tractor that powers a mechanical shaker digger which also pulls a harvesting wagon.
- Another employee occupies the platform mounted on the shaker digger and receives the nursery stock as it is dug.
- The last staff member, situated on the harvesting wagon, gathers the stock from our employee on the platform and loads the wagon efficiently.

Originally, the harvesting wagon was constructed using a standard agricultural chassis with the deck measuring 36 inches off the ground. Now the wagon is built using an implement chassis and the deck is 19 inches from the ground, facilitating nursery stock handling between the platform and the wagon.

## **PROCESSING AND SHIPPING FACILITIES**

Once the stock has been harvested and stacked on the wagon, it is transported directly to the processing and shipping facility. Because we do not process our stock by bundling and tagging in the field, our stock is not subjected to the dry environment characteristic of our field conditions. This temperature- and moisture-controlled facility is equipped with a sunken driveway, allowing machinery and wagons to enter or exit at either end of the building. The drop of this driveway is the same as the height of the wagon deck, making the wagon level with the floor of the facility. The incentive for creating this lower level drive-through system was years of awkwardly and arduously stepping on and off wagons with armfuls of nursery stock. Currently, the unloading of wagons is facilitated by an even step between the wagon deck and the floor of the storage shed. Because the trees are pre-graded in the field, the processing staff can quickly inspect stock for root structure and damage caused by harvesting as it is unloaded from the wagon. Trees and shrubs are processed, tagged, and bundled, directly from the harvesting wagon. This system also eliminates extra labor and space required to unload stock into piles, then pull these piles apart to tag and bundle stock. The savings in storage space that we have realized by changing to this system are significant. Prior to our new facilities, we occupied two storage sheds with a total floor area of 5000 ft<sup>2</sup>. Today we process 25,000 pieces of stock annually occupying only 4200 ft<sup>2</sup> of floor space with the ability to process another 75,000 pieces of stock annually. In addition, this drive-through feature eases loading the bundled trees and shrubs onto delivery trucks. "Straight" trucks are able to pull along the drive-through where stock is gathered from either side of the facility and loaded. The system conserves the extra handling required when first loading pick wagons, then using these pick wagons to load delivery trucks. As the delivery truck moves through the shed, the stock to be loaded is never situated more than 20 ft from the truck.

## **BENEFITS OF THE SYSTEM**

The modifications to the harvesting and processing system generated greater safety and efficiency for our staff and healthier conditions for our stock. It requires fewer people and machines to harvest more stock. The reduction in physical demands and moving machinery has created safer and more comfortable working conditions for our employees. Unlike other systems which employ field processing, our stock is transported directly to a moisture- and temperature-controlled facility, eliminating the stress of the field environment for our staff and nursery stock alike. We are able to process more trees and shrubs with a smaller facility. While processing and shipping, the stock is handled less, preventing damage and conserving human resources and time. We are satisfied with the modifications we have made to our systems particularly because they were inexpensive and relatively simple to achieve.