

Nursery Innovation on a Budget-Making Every Penny Count[®]

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INTRODUCTION

Today's nursery business faces increasing expenses and operating costs on a daily basis. Increased expenses include: labor, supplies, shipping and taxes. Improving efficiency of operations through innovations is one of the best ways to increase profitability. The first step for innovations is a willing attitude for change. Innovations in a business need not cost a large amount of money - in order to enhance efficiency and save money in the long run. Innovations entail improving the nursery site layout, changes in organization of supplies and products, addition or modification of equipment, changes in supply management - and enhancing and streamlining organization and communication with personnel.

NURSERY SITE LAYOUT

The nursery site layout is something that many businesses never consider until they change locations. The layout of a nursery should maximize efficiency in the movement of people and materials – including sales, chemical applications, irrigation and drainage, shipping and supply management. A curvilinear layout is often considered one of the most efficient designs for a nursery (**Fig. 1**). There is no need to wait to improve your layout for efficiency.

Placement of crops is something that many people overlook. There is more to plant placement than just light or winter protection requirements. Laying out an operation

includes grouping: 1) plants nearest to the sales area, 2) commonly sold plants together, 3) plants with the same chemical requirements for one stop spraying, 4) high or low water usage plants together - based on irrigation needs, and 5) low water use plants in drainage areas when capture of water runoff is not feasible.

Location and control of highway vehicles on the nursery is becoming more important. Locating the receiving, shipping and customer pickup in the same area - allows crews to assist each other and reduces traffic flow of non-company vehicles on the property. Many nurseries are changing their customer and delivery areas to meet quarantine requirements.

SIGNAGE: PLANT AND SEASONAL QUOTAS, SOIL MIXES, HORMONE RATES

Using signage to enhance efficiency is often overlooked. Many companies are concerned at the initial cost of signs or that people will steal their production information. Most production info is only relevant for that particular company and crop mix. Signage cost can be minimal - while significant savings in time, money and accuracy is gained in the long run.

Mortellaro's Nursery, Ltd. uses signs for hormone rates, standard and seasonal production numbers, soil mixes, pictures of insects and disease, and scheduled chemical treatments. At our nursery, we post signs on blocks and greenhouses that list quantities of each crop in the block or greenhouse (**Fig. 2**). The signs list year-round and seasonal quantities needed. This allows production crews to do quick visuals of what crops need to be potted - and allows managers to prioritize crop varieties rather than worry about needed production numbers on a daily basis. The same signage is used on propagation

tables so that the propagation department fills a production need as soon as it appears.

Colored signs are used for different propagation soil mixes and those colors are also used for the colored saran that is wrapped around pre-filled pallets (**Fig. 3**). The color system solves any language or literacy problems with our crews.

TOOL TRANSPORT AND STORAGE

Small, 2-cycle gas engines are used extensively in our nursery. We find it easier to store these machines in our shop on a pallet and set it outside daily for crews to sign-out and sign-in, as needed (**Fig. 4**). This method reduces traffic flow in our shop area and avoids disturbing our mechanic. Storing of handheld power tools was also an issue until we created two different methods of storing them along with batteries. We utilize locked cabinets for tools used by field employees and unlocked storage for maintenance and mechanics in our shop (**Fig. 5**).

USING PALLETS AND BARRELS FOR ORGANIZATION

Many nurseries receive all of their supplies on pallets, but do not consider reusing those pallets for other uses. We use metal racks/pallets for storing our used pots and to transport those pots between our two business locations. We also use the metal frames from pallet totes to store material and supplies. All shade cloth and frost blankets are stored in metal tote frames when not in use. During winter, the pallet totes are placed next to the blocks where they may be used and covered with plastic.

We use cardboard and plastic barrels to hold our poly lock, nails, and staples for winterizing. The barrels and all supplies are stored in a tote frame until needed. We use small 1-gal blue sealed barrels to hold nails or bailing twine to protect it from the weather and keep it in usable condition (**Fig. 6**).

We store all totes in cargo containers to keep them protected from rodents and the elements. We also use the tote frames for storing load locks, blocks and cardboard shipping supplies on our dock.

MOBILE HOME ANCHORS AS TREE ANCHORS

There are many methods for anchoring trees. We utilize three techniques to anchor trees at our operation. Our most recent method utilizes mobile home anchors and mule tape to secure large containers from blowing over. We anchor the pot to the ground rather than anchoring the trunk. We created a steel frame to hold the anchors in place so that one person can install the anchors.

HANDHELD WARN WINCH FOR INSTALLING GREENHOUSE HEATERS

In the past, we used two men with ladders and a rope hoist to raise and support greenhouse heaters until they were bolted to the greenhouse bows. The time needed was about 45 minutes per house. Two years ago we started using a 110 volt Warn handheld winch (https://www.warn.com/utility/portable_winches.jsp) to raise heaters from the ground to their mounting points in the greenhouses. We also created custom muffler clamp brackets for each heater. Each heater can be mounted using just a 1 cm (0.5 in.) wrench and four nuts. It currently takes one man on a ladder and one man on the ground about 15 minutes to raise and mount each heater.

PLUMBING TRAILER

We purchased a used U.S. Air Force jet support trailer many years ago. We stripped the trailer of its hose reels and stocked it with all of our plumbing supplies including a water pump, a generator, and a compressor (**Fig. 9**). We haul the trailer to plumbing or construction projects on our property. This allows us to have the supplies needed at the

worksite - rather than inefficiently running back and forth for supplies. A used utility truck body could be utilized for the same purpose.

CONVEYORS

We have purchased used roller conveyors and modified them for different uses. We utilize small 0.3 m² (3 ft²) square rollers to move 95-gal and 200-gal trees on customers' trailers (**Fig. 10**). We use 1.2-1.8 m (4-6 ft) long roller conveyors to load 30-gal and 45-gal containers from and onto trailers. The conveyors not only reduce potential employee injuries, but also eliminate the need for equipment for larger trees and shrubs.

TRACTOR WEIGHTS

Rather than purchase brand specific weights for tractors and skid steers - custom weights can be fabricated. We have used large idler rollers, large used sprockets, old tractor wheel weights, or even concrete filled pipes for weights. Any style of weight will work with the correct method of attachment. Custom weights can cost from \$ 0.22/kg (\$.10/ lb) with concrete or older weights - rather than \$2.2- \$4.4/kg (\$1-\$2/lb) with new factory weights.

IPAD TABLETS

IPad tablets are used extensively at Mortellaro's Nursery (**Fig. 11**). We supply tablets to all managers, supervisors, drivers, and chemical applicators. We purchase used iPad Air Tablets from Apple and protect them with a lifeproof case. This is a cost of only about \$450 per iPad. The cost is minimal with the benefits gained. The iPads are used for group texting, tracking drivers' locations and hours, multiple inspections and reports, email, shared calendars for each department, reference for customers, plant info, and chemical applications.

Managers use a custom written app for the following uses and reports are automatically delivered to the appropriate person:

- Insect and disease scouting
- Equipment repair tickets
- Employee warning reports
- Monthly on site equipment inspections

Drivers use the iPads for Google maps to route deliveries, check for delivery vehicle access problems, and traffic or construction delays. The iPads are also used as an Electronic Logging Device for DOT record keeping. We are able to track the drivers through Apple at no cost - using “Find My Friends” as well as the ELD software. The ELD software provides all management a current list of hours available for each driver daily. We are able to communicate with drivers for upcoming deliveries, safety meetings, corrected invoices or other customer issues at any time.

Supervisors and chemical applicators receive group texts, insect and disease scout reports, production changes and any other relevant information as needed. They also have access to any production or chemical treatment info or history at the nursery.

CARGO CONTAINERS FOR WORK AND STORAGE

Cargo containers are excellent as an inexpensive building option for shop use, storage and secure office space (**Fig. 12**). Two cargo containers can be placed with a roof between them to provide covered and even lockable storage inside and outside the containers for equipment repair and storage, fertilizer or chemical storage, or a field or sales office. Better still: using cargo containers allows the construction of an office or storage area that is classified as temporary structure and avoids the need for building

permits and increased taxes for structures. Currently cargo containers can be purchased for about \$2500 each for a 12 m (40 ft) unit with double doors.

CONCLUSION

An open attitude to change is a necessity for innovations to work. Change needs to be welcomed rather than feared. Innovations come in many forms such as new ideas, different styles of communication, different work methods, modified or new equipment, and new technology. Innovation needs to be encouraged not only from top down, but also bottom-up - from the people working every day. Your employees can have great ideas for changes - if you encourage their input.

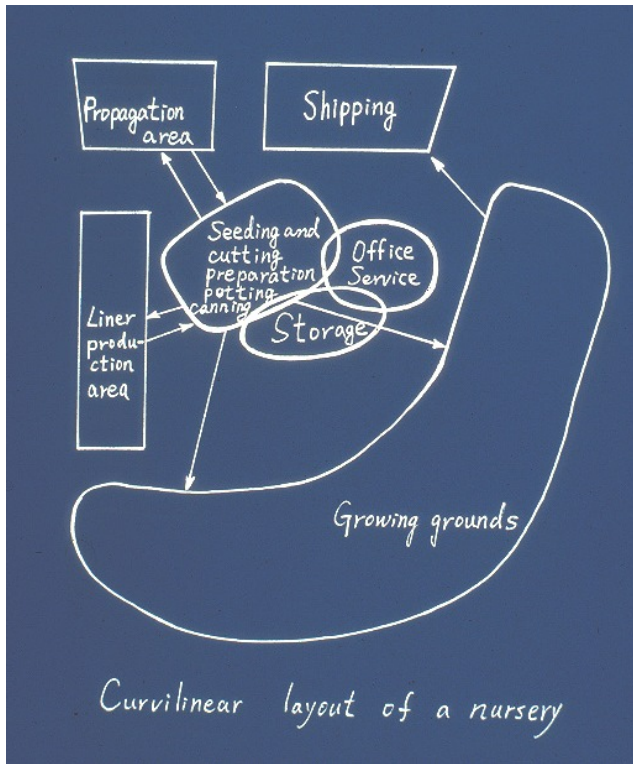


Figure 1. A curvilinear layout is one of the best designs for nursery production.



Figure 2. Production signage lists for greenhouse bow space usage.



Figure 3. Colored signage for soil mixtures, including color-coded shrink wrap of media on pre-filled pallets.



Figure 4. Gas powered tools are stored and transported with racks attached to pallets.

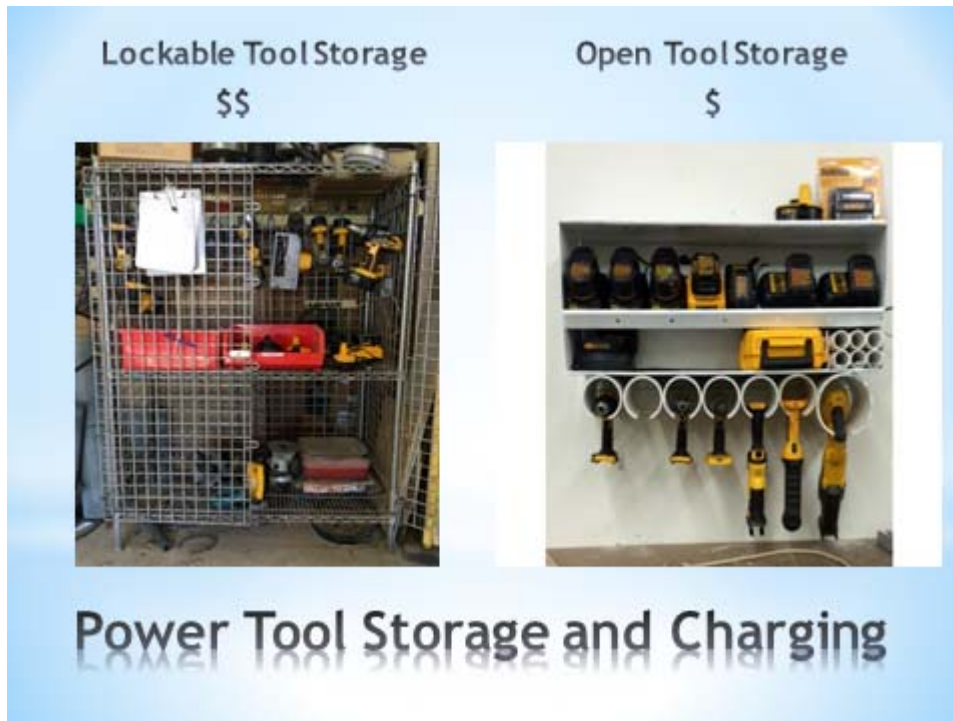


Figure 5. Lockable and open tool storage and charging area.



Figure 6. The \$20 tote pallets can be placed where needed.



Figure 7. Tree staking with mule tape, hose, scrap carpet and mobile home anchors.



Figure 8. A Warn winch can lift heaters with little employee effort.

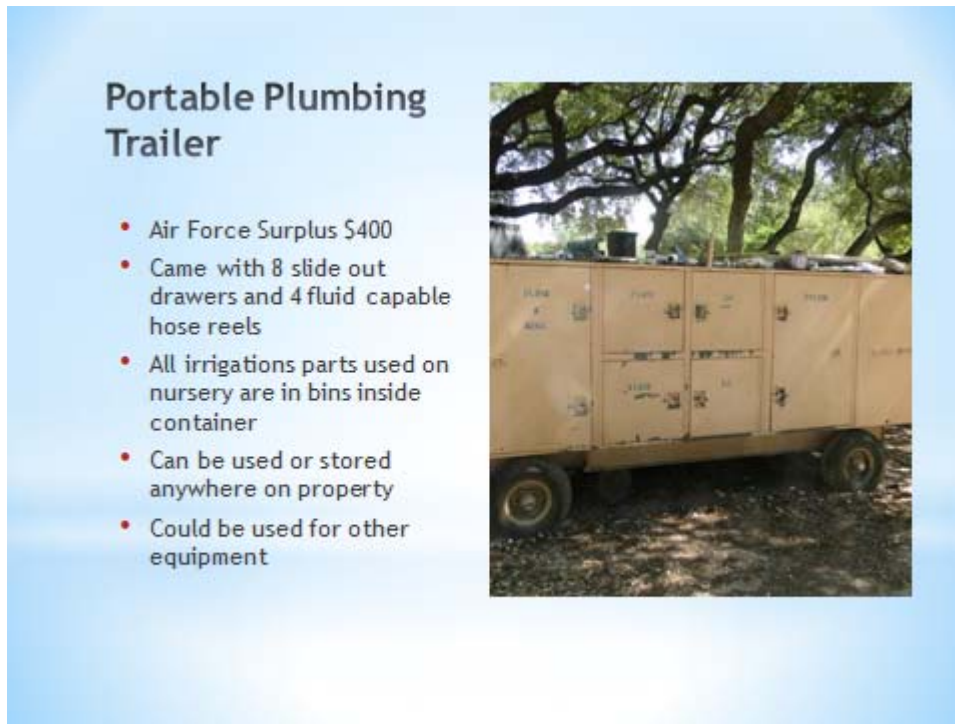


Figure 9. A portable plumbing trailer converted from a U.S. Air Force surplus jet support trailer.



Figure 10. Used, portable conveyors for moving large containers.



Figure 11. Apple iPad tablets are used extensively at Mortellaro's Nursery.



Figure 12. Cargo containers can be utilized as inexpensive building options for shop use, storage and secure office space.