

Experience With Mechanised Container Plant Handling and Dispatch[©]

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INTRODUCTION

John Woods Nurseries produces more than 1.7 million plants per year, across 13 different product groups. Potting young plants into their final pot is one of the most intensive production processes on the nursery. Timing is vital in the potting processes to ensure the finished plant is ready when the customer needs it. We also recognised a need to increase productivity and reduce labour costs in the despatch process. This paper describes our search for more efficient systems to increase productivity and reduce labour costs, and our experience with the chosen systems.

CONTAINER PLANT HANDLING

After 18 months of planning and research we made the decision to invest in the Visser Space-O-Mat pot handling system.

With the help of Brinkman U.K. and Visser Holland, we investigated various layouts of potting machines, compost supply, young plant supply, pot supply, bark supply, and transport of potted plants away from the potting area. From this we could find out what extra machinery we needed and the size of conveyer belts, bark topping machine, and big belt buffer required.

The size of the big belt buffer was very important. We had to make extensive time trials on the distance the forklifts had to travel to the growing beds, put plants down and come back to the shed to clear more plants from the buffer belt in the shed. From these trials we decided to use a (10-m-buffer) belt, with watering bar to irrigate plants before moving out.

The Space-O-Mat forklift is designed to carry pots in full pot-thick blocks and can then either space-out the pots into the beds or lay them down in their pot thick blocks. We had the spacing forks made to 2 m in width to ensure that the system would fit the majority of the areas on the nurseries. We sent Visser precise measurements of the various pot sizes we use so that the sets of transport forks and spacing forks could be made. These were made to be fully adjustable to cover pot sizes from 1 L to 7.5 L (13 cm to 25 cm). To cover the range of pots, two sets of transport forks and two sets of spacing forks were made. The Space-O-Mat forklift has an on-board computer to control the spacing forks to allow the pots to be spaced in the correct order and spacing.

The nursery has various types of open beds, tunnels, and glasshouses all with different types of flooring: open gravel beds, Mypex open beds, Mypex tunnel bed areas, open sand bed areas, and glasshouse sand bed areas. Visser forklifts have special wide tyres with low ground pressure so can travel on the different beds without damaging them.

Since the initial project, a further forklift has been purchased purely to carry the transport forks. This has allowed us to increase output of the system further by using one forklift to take away potted crop and put it into a buffer area close to the



Figure 1. Visser Space-O-Mat forklift in use at John Woods Nurseries.

potting areas. The second spacing machine can pick up from there and space out into the nursery beds. This allows crops to be put down pot thick into nursery beds and then to be picked up later and spaced out. It also means we can use the various covered areas such as tunnels and glasshouses in the winter at high capacity and then space out later when the plants start growing.

During the busiest periods in spring we can pot with a minimum team of three.

Table 1. Labour savings made using the Visser pot handling system.

Task	People required before Visser system introduced	People required after Visser system introduced
Potting supply	1	1
Taking off and loading onto trailers	1	0
Potting	1–2	1–2
Transport to final location	1	1
Setting down	2	0–1
Total labour	6–7	3–5

MECHANISED BARK MULCHING

At the same time as introducing the Visser Space-O-Mat, we installed a bark topping machine, also supplied by Visser. Applying bark mulch as a pot topping reduces moss and liverwort contamination, reduces the amount of herbicides used for weed control and helps to speed up despatch processing.

The machine mulches pots with 10-mm layer of bark or other loose mulch product. The pots must be filled with growing media to no more than 10 mm below the rim to allow the topping to be applied. Special pressure plates have been made to ensure this 10-mm recess happens in each pot during filling. Each pressure plate is made up to fit the correct pot size from 13 to 25 cm.

Special attention is needed to have the correct grade of bark, which must be even in grade and dust free to allow best coverage. We currently use 5- to 12-mm potting bark.

During the first 18 months of use we have noticed a 50% drop in despatch labour as a result of reduced preparation time in cleaning plants ready for despatch. We have also seen a 15% drop in pot herbicide use.

MECHANISED DISPATCH

We recognised a need to increase productivity and reduce labour costs in the despatch process. Before embarking on any changes we studied the existing system over a full year paying particular attention to:

- Order processing.
- Lifting of orders.
- Despatch processing of orders.
- Labelling.
- Presentation of orders.
- Delivery.

We saw that our despatch processing area was labour intensive and costly and that we could make more cost savings by better packing of the despatch trolleys.

Our old despatch system used a single line process with the following personnel:

- 1 × line loading
- 2 × pot washing
- 2 × plant labelling
- 2 × trolley loading and checking

Output per line was 42 trolleys per 8 h shift.

By purchasing a system which allowed orders to stack up on a big belt buffer, we could increase output and improve presentation of our product. It also meant we could manage the packing more efficiently to get more plants on a trolley.

By re-planning our shed layout this enabled two 12-m systems to be installed with enough room for a third line to be installed at a later date if needed.

Labour per line is now:

- 1 for line loading
- 2 for pot washing
- 2 for plant labelling
- 1 for trolley loading

The saving of one person is coupled with output increases in an 8-h shift to 120 dispatch trolleys per line giving a 185% increase in output plus better presentation and trolley use.

We are investigating further savings in this process by using automated pot washing and labelling systems.