

# Mechanisation of Nursery Production and Handling Systems®

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## INTRODUCTION

I started my career in horticultural machinery as a service engineer but after nine months I was moved into the sales department — either I was a good salesman, or a terrible service engineer. Anyway, very early on in the trade, I had to visit a very reputable nursery in Lincolnshire. When I arrived, the nursery owner was standing working at the potting machine I was to repair. He was filling 9-cm liner pots and placing them into a tray, which he then placed on a free-standing piece of powered conveyor — the tray of pots travelled just 5 m down the conveyor to a man who took the trays off the conveyor and placed them onto a trailer.

I asked the grower why he was bothering with the conveyor — why not just carry the trays? He took great delight in telling me that he had done his sums and worked out that the conveyor saved him about 100 miles of walking every year. When I got home I did the sums for myself. Assuming the trays held 15 pots each, and the walk to the trailer was 5 m and then 5 m back to the potting machine, you would have walked 100 miles by the time you had potted 240,000 plants.

I learned a lot from that experience, as my understanding of mechanisation up to that point related to mass production of small parts on milling machines and lathes (everything being contained within the machine that was doing the work). Whereas, as we all know in the horticultural trade, to produce a potted plant and make it ready for sale involves a lot more variables than producing a machined part in a lathe. The distance that you have to travel with a tray of plants, and the work to grow them and get them out of the door, is huge.

I have met other growers who have actually counted how many times a plant is handled from where it is potted to where it is dispatched on the lorry — without some sort of machinery to help, it can be as many as 28 times per plant.

Mechanisation on a nursery involves much more than just machines and conveyors; it can also be applied in a very basic form to things such as positioning of doors for easier access of trailers and trolleys, the laying of paths and concrete standings to allow greater accessibility to all the working areas, and the careful organisation of staff.

It also applies to other areas, such as compost supply, which can be efficiently streamlined if thought out correctly.

## MAIN BENEFITS OF MECHANISATION

**Reduced Labour Costs.** Careful application of equipment allows you to reduce the number of part-time staff and, in turn, make better use of full-time staff.

**Improved Output and Focus.** Much higher output within a given time-frame helps you to plan your work with greater efficiency.

**Improved Crop and Uniformity.** The automation of, for instance, filling compost in trays and pots will help to dramatically improve the consistency and uniformity of the products you are growing and, therefore, help to control the overall quality. Getting plants laid out more quickly onto beds can also improve overall consistency of the crop, especially with the fast growing plants.

**Improved Marketing.** With the benefit of faster production and reduced costs, new product lines can be experimented with at a lower risk, to increase your range of products.

**Create More Time for Business Management.** Mechanisation is especially important for smaller nurseries. It may appear that you can do without it, but there are huge benefits in having equipment that will reduce the time you have to spend on the “slog jobs” and big “time killers” such as potting or carrying products around.

**Staff Morale.** I have delivered equipment to numerous nurseries over the years, and on occasions the staff have been unhappy or felt threatened at the thought of using a machine. However, they soon realise that the equipment is there to help them, and reduce the arduous elements of their job. This aspect of mechanisation is sure to increase in importance due to the difficulties in recruiting nursery labour.

## **RISKS ASSOCIATED WITH MECHANISATION**

It is important to recognise that there are dangers of over-mechanisation and that you need to mechanise to suit your own specific requirements. Beware of equipment with a higher output than your operators are capable of coping with. This would result in the system having to pause or stop, reducing the overall average production of the operation. You should also avoid situations where your output becomes wholly reliant on the machine and you have no staff left to “carry on regardless,” or when production cannot continue without the use of the machine.

When things go wrong, how is the problem dealt with? How good is your service agreement?

Health and safety is also an important consideration. All mechanical equipment carries an element of risk in operation. However, carrying out the same job manually also carries a health risk. Workers are subjected to as many risks from non-mechanical sources as from automation, such as back injuries from lifting or pulling and repetitive strain injuries from repetitive work and bad posture.

## **MECHANISATION IN ACTION: THE GAL SEEDING LINE**

GAL Systems was commissioned to build a seeding system that would de-stack trays, fill them on a filler, dib them, sow the cover, water, and re-stack them — all with only two human operators. To achieve the output the customer required, the whole system had to run at a speed of one double six pack every 3 sec.

We designed a system in which the worker loading the de-stacker was also unloading the finished product and stacking the trays onto a pallet. The system consisted of an 18-m input conveyor to the de-stacker, in which the trays were stacked five high and butted up to each other. The trays travelled down to the de-stacker, where they then double-backed into the seeding system and would finally end up back at the first worker for re-stacking. As they doubled back down the line they would be filled, dibbed, seeded, topped, watered, and finally stacked

back up again on a stacking machine and pushed onto a roller conveyor, where the worker loaded the packs onto the pallet. The second worker's job was to keep an eye on the seeding machine.

### **CONCLUSION**

Mechanisation is less about going as fast as possible and more about keeping production steady and avoiding unnecessary pauses or stoppages. A steady, even pace is the key to both higher output and higher quality output. I would like to finish with a quote from Microsoft founder Bill Gates: "The first rule of any technology used in a business is that automation applied to an efficient operation will magnify the efficiency. The second is that automation applied to an inefficient operation will magnify the inefficiency."