Experience of Applying Lean Manufacturing on a Container Nursery°

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INTRODUCTION

Lean manufacturing is about improving efficiency and productivity and decreasing waste in the workplace. By following seven sequential improvement steps a business can save time and costs in all areas of activity.

In implementing lean manufacturing at Lowaters Nursery, our aim, as managers and supervisors, was to involve staff in tracking the time taken, movements involved, and cost of propagation by cuttings from the moment the secateurs were picked up by the person obtaining the propagation material to the moment the finished plant was put onto the lorry for despatch to the customer. We worked with the staff involved to identify where efficiency improvements could be made. We were amazed at the results.

STEP 1: PROCESS MAPPING

A good visual way to start is by using a "string diagram" on a scale drawing. This will show you straight away the lack of order and considerable movement of people, tools, and materials involved in each task.

To do this process mapping you need a stopwatch, tape measure, and process activity chart. By observing a person carrying out a task we recorded and numbered all the process steps required to perform it, the time taken to do it in seconds, the distance travelled in metres, and whether it was adding value to the end product or not. Non-value-adding (NVA) tasks make up 95% of wasted time or costs on a typical nursery. This includes waiting time, delays, unnecessary movements, excess production, set-up time, breakdowns, searching for tools or materials, and storing. Value-adding (VA) tasks include those such as taking cutting material, sticking the prepared cutting, putting unrooted trays onto the prop-bed to grow, potting-up, trimming, adding picture/price labels, and loading onto the trolley ready for despatch.

STEP 2: IDENTIFY VALUE-ADDING AND NON-VALUE-ADDING TASKS

On the activity chart we used different coloured sticky memo notepapers to signify VA tasks and NVA tasks, respectively. Each note detailed the step number, activity, time, and distance in red, black, blue, and green inks, respectively. We could then focus on reducing or eliminating the NVA activities and calculate how much money we could save.

From the records taken, the journey of one plant from cutting to end product took a grand total of 131 steps, of which only nine were VA. These VA tasks took a total of 30 sec. Non-value-adding steps took 8.8 h and involved the plant travelling a total distance of 3,038 m.

STEP 3: IDENTIFY ALL POTENTIAL SOLUTIONS TO ELIMINATE NON-VALUE-ADDING TASKS

Brainstorming, then experimenting with different suggestions and evaluating them enabled us to speed certain processes up and has made many of the jobs easier and more efficient. In propagation alone. from taking the material out of the fridge to putting the stuck trays down in the fog involved 15 actions, only two of which were VA. To make one cutting either it or the workers involved travelled 210 m and took 285 sec. By streamlining the work area and working more efficiently we eliminated four NVA activities, reducing the distance travelled to 140 m, and the time taken to 170 sec.

STEP 4: REJECT ANALYSIS

Another improvement process within lean manufacturing is reject analysis based on "the 5 whys" For example:

- Why did we lose more than 2,000 of a batch of one particular taxon of Liebe to disease?
- 1,500 had *Botrytis.* Why?
- Environmental conditions. Why?
- Wet months. Why?
- Exaggerated by poor ventilation. Why?

Solutions included introduction of a preventative spray programme; improved instructions to the workforce on dumping dead material; regulating tunnel-side ventilation for frost, sunny, or rain conditions; giving the plants more space; and training staff on the correct way to water.

If you don't follow a line of questioning to its ultimate conclusion the problems will recur and continue to result in wasted time and money. Then you can make an educated decision whether to continue a process or drop it. If it, is recognised that batches are still unsuccessful, don't continue with them in production.

STEP 5:THE FIVE Ss

This is the starting point for continuous improvement and is based on a fundamental clear-out of the work place involving the whole production team.

Sort. All unwanted or unnecessary items are tagged and removed from the workplace. Any items in need of repair should be tagged for attentions. Infrequently used items should be stored away.

Set. Give everything a logical home and to a standard needed for an effective workplace. Everything has a place so keep it there. Frequently used items need to be within three steps of where they are used.

Once everything is in its place, the next step is to make visual signs and marked out locations for materials — for example shadow boards marking the location to which hand-tools should be returned for rapid access next time they are needed. At Lowaters we have different coloured labels to show whether plants need to be trimmed, dumped, lifted for despatch, weeded, watered, etc. There are bed labels for sterilised beds and white-boards on which we can flag-up problems and day/week targets. Efficiency has increased as movement and searching for items has been improved.

Shine. This is, simply, keeping the area clean and leaving it as you found it.

Standardise. Implementation and training across the whole organisation.

Stick. Most importantly, stick to the five Ss,

STEP 6: PRODUCE AN IMPLEMENTATION PLAN

New plans need to be prioritised. Have a person responsible for getting it done and a time scale. These should be reviewed weekly or monthly. Don't change things for change sake, you may find it won't make an improvement. Be aware that making changes at one stage may produce a knock-on effect down the line.

STEP 7: RUN TRIALS

It. is very important to involve all employees and brainstorm any ideas as a team to get the most suitable working layout. Continuous improvements means benefits achieved and lessons learned. The new patterns of behaviour will soon become the norm.

CONCLUSIONS

For the lean manufacturing processes to work it is vital to track the action points each month to ensure continuity with your teams.

By focusing on NVA across the nursery and improving on our movements we were able to save a total of 534.5 h in a year, which amounts to £3,581.15.

If you do nothing then you will fall behind your competitors as they improve. Just remember, waste is costing your business not your customer.

The mapping process made us focus on our wastage or NVA so go in with an open mind — although you think your area may be efficient, think again!