

Application of Lean Manufacturing to Nursery Stock Production at Johnsons of Whixley®

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INTRODUCTION

Lean manufacturing is a simple and effective way of improving systems. The costs of the lean approach are proportionate to the scale of the business. However, the lean way of operating must be embraced by organisations as a whole; trying to apply it to selected parts of an organisation will not be effective. The processes of plant production can be analysed and improved in just the same way as those in any other industry. The fact that the product is a living organism is no justification for inefficiency on the nursery. This paper will cover the basic principles of lean manufacturing, the practicality of its application, and the reality of trying to operate under the philosophy of a lean regime in an industry where investment cash is scarce.

THE PRINCIPLES OF LEAN MANUFACTURING

Henry Ford developed the concept of lean manufacturing to increase quality and workers' pay while reducing the price to the consumer. Subsequently, Toyota's Taiichi Ohno developed Ford's principles to "Just in Time." Lean manufacturing is different from supply-driven batch and queue production where products are delivered in batches then queued for the next process. This batch-and-queue system is imposed until the product is shipped. In contrast, the trigger for lean is a pull from the customer.

Five Lean Basics. Lean manufacturing is based on five simple precepts:

Value. Value relates to ends, not the costs of the means. Consumers of 3-L plants are not interested in the processes that occur from 9-cm liner to the finished product. They just want a nice garden.

Stream. It is the whole chain, and the interaction of processes within that chain, that controls efficiency, not the separate elements. Processes need real-time mapping, and those that do not add value should be stripped out.

Flow. The process stream must be continuous, without batching and queuing.

Pull. It is only demand that should dictate quantity of product and timing of delivery.

Perfection. The driver for all processes can only be quality. In both product and process management, compromise solutions are not acceptable.

Seven Wastes. Waste reduction underpins lean manufacturing. Waste is anything that does not add value to the customer. Eliminating waste allows more to be done with less — less capital equipment, floor space, operator effort, direct labour, indirect labour, inventory, and lead-time. There are seven key elements of waste:

Overproduction. Too much too early.

Waiting Time. Arises when the flow is not continuous and customer pull is lost; neither product, staff, nor customer should ever be kept waiting.

Transportation. Any movement of people, vehicles, product, or equipment. Movement always incurs cost.

Inappropriate Processing. Excessive equipment capacity and repeated activities.

Stock. Stock acts as a buffer for inefficient process control. But storage and maintenance of stock is costly and reliance on stock obscures the need to tackle underlying inefficiencies.

Motion. Operator bending, stretching, lifting, carrying, or moving that is detrimental to productivity and to health and safety.

Scrap. Maintaining defective product incurs progressively greater costs, which can be avoided by early action.

New Wastes. Contemporary production has identified new forms of process waste. Untapped and lost human potential follows when poor managers fail to bring forward innovations suggested by more junior staff and where talent is not channeled by proper training. Mutual respect allows upward as well as downward management, and training delivers the next generation. It is not a matter of “what will happen if I train them and they leave,” but rather “what will happen if I do not train them and they stay.” A better-trained staff should also enable useless activities and overblown bureaucratic regulations and systems to be stripped out.

Previously abundant resources such as materials, energy, and water are now scarce and increasing in cost. Abandoning non-essential processes, reducing usage rates, and embracing recycling technologies will improve profits.

Customer choice opens opportunities for business expansion; while time and money spent regaining lost customers is a wholly avoidable resource waste. Nowadays, customers see time as their most valued resource. Customer time is wasted by complaints, returns, repeated queries, inadequate customer databases, and silly phone answering systems. Customers should not be made to wait or waste their time.

Sustainability. The lean framework for sustainability requires change. The business processes are redesigned to increase product life, to reduce product maintenance, to ease recycling activities, and to avoid pollution. Reductions in energy and materials used in manufacturing and product care are identified and implemented, while ensuring the highest possible proportion of what is produced is despatched to the customer. As much as possible of anything not despatched should be recovered, recycled, or re-manufactured.

The Workplace. The first essential for managing change is correct targeting. This in turn needs an acute understanding of the business’ processes, and its people. This understanding comes from on-site observation of the workplace, direct personal contact, first-hand knowledge, and getting involved.

NURSERY APPLICATION OF LEAN

Johnsons of Whixley is a large producer of nursery stock for both the retail and landscape/amenity markets. It has completed lean projects relating both to nursery production and office systems. Implementation has not proved costly, but the benefits are proving substantial. The company uses the following steps:

- 1) Identification of the process to be examined, and the clear delineation of the boundaries of the target activities.
- 2) Mapping the processing in real time to identify which steps add value and which do not. This requires close observation, a critical attitude, direct involvement with the resources employed, and honest admissions to failings. Notes, diagrams, and charts are helpful in mapping.
- 3) Analysis. First the mapping is analysed in a general way to
 - (a) show the proportion of time spent on value-adding steps,
 - (b) identify the time split between different tasks,
 - (c) highlight the issues and problems and pinpoint causes of waste,
 - (d) show the areas where there is greatest opportunity for change, and
 - (e) give benchmarks from which to work.Next, after the general analysis has been completed, further questions can be asked about the value of each point in the process under study. Does it add value for the customer? Does it add value to the process? Does it add value to the business? Does it add value to the service? Does it add any value at all?
- 4) Implementation of changes should be immediate. This requires support from the whole organisation for adopting a lean approach to operating. There needs to be a confidence in the decisions that have been made and a determination to make them stick.
- 5) Review and repeat. The process of lean is ongoing. Once started, it should be maintained as a continuous culture. This needs senior management drive and the embracing of lean by the whole organisation.

In reality the most difficult part of lean is in maintaining this last step. Discipline and maintained enthusiasm is required throughout the company, from the very top to the very bottom. It is at this stage that there must be a real commitment from the top to ensure that the lean philosophy has been taken on through the whole business. It is helpful to choose one section of the operation at a time, train the people in the techniques, get them comfortable with the philosophy, and give them the time to look at the processes that they are involved in. The gains in efficiency, effectiveness, and professionalism will be apparent to everybody, and once one sector is operating under a lean regime others will want to follow.

CONCLUSIONS

Positive results have been seen in all the horticultural businesses that have undertaken lean projects. A real long-term benefit comes when a change in culture occurs such that lean becomes the norm.

There is a danger of assuming that products from nurseries, commanding a relatively low unit price, justify low quality production processes. But this leads to inefficiencies and higher production costs. Low quality product will continue to demand a low price and be costly in its production. However, aiming for perfection by implementation of the five lean basics, using high quality inputs (including the human resource), and eliminating waste will attain a high quality, high value output for less input cost.

The philosophy of lean is based on perfection, elimination of waste, and improvement of profit. The result of lean implementation is continual improvement in systems: managers spending their time managing and the workforce becoming more motivated as they begin to achieve. People begin to think differently about what they are doing and why they are doing it. It is not true that horticulture needs be inherently wasteful of the resources that it uses, and such ideas should not be used as a convenient, but erroneous, excuse for inefficiency and an unwillingness to embrace change.