# Lean production and your plant factory©

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We all deal with doing more with less. There was a time in my career when I thought that the entire "more with less" situation was unique to my generation and time. I'm now convinced that sooner or later everyone will be faced with trying to match production goals and expectations with limited and/or declining resources. Over the years, new techniques and thrusts have risen to the forefront in the areas of production efficiency and cost reduction. Each new method has had its own merits and some seemed to last longer than others. Lean production has its roots in many of the techniques developed in the early 20th century on the first production assembly lines in the USA. It is perhaps because of the history and pedigree of "Lean" that it works so well for so many diverse industries. Lean is, in many ways, more common sense and intuitive techniques than hard core science. Perhaps this explains its draw and staying power. Toyota is credited with refining what we call lean production through the development of the Toyota Production System. After little interest in the USA was expressed in the ideas of pioneers including Juran and Deming, Japan opened its doors and minds to adopting the techniques that made them one of the top manufacturing dynamos in the world.

Historically, Lean has had most if its success in support of pure manufacturing processes. Over the years, other industries have joined the ranks of success stories associated with lean implementation. Upon examination of the characteristics of a typical manufacturing process, concepts such as customer driven order processes, inventory management, concerns over cycle time and quality, and time sensitive delivery come to mind. At its most elemental level, a nursery/greenhouse operation is really no different. If you can see past the argument that growing a plant is inherently different than building a "widget", Lean techniques can easily be adapted for use in your "plant factory".

Most process owners interested in diving into Lean, can do so without going any farther than the 5 S's. These 5 concepts, conveniently all starting with the letter "S", are the bread and butter of any Lean implementation and are described below.

1) Sort: Sorting items necessary for each process stage from those items deemed unnecessary, is the first step. These decisions can be difficult to make; sometimes made easier by using "outside" eyes. Over time, it is common for supplies to be left behind long after processes change, causing a build-up of items not required for the current process needs.
2) Set in order: Once you've ensured that only the process driven items are located at each work station/area, arrange these items in an order based on process needs, i.e., items used more often should be positioned closer to the point of use.
3) Shine: One of the best ways to maintain order is to keep work areas clean. Given that you will expect employees to maintain a clean work area, make sure to provide ample time during the day to support this expectation.
4) Standardize: Having standardized processes helps to ensure that employees are providing consistent results. Remember that undocumented (verbal) processes are not different than non-standardized processes; so be sure to establish more formal, written process definitions.
5) Sustain: If the prior 4 "S's" are handled correctly; it's not too difficult to maintain the system. Typically, breakdowns occur with the movement of new employees and/or managers into an operation. An effective new employee training process can help to mitigate any problems.

The customer is the focus (as well as making a profit!) within the lean system.

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Customer focus can be summed up by looking at three areas: quality, cost, and delivery. Quality is an absolute as much as it is a customer perception. As a process owner, we establish the minimum quality levels we are willing to accept as outputs from our system. By the same token, the customer will establish their own perception of the level of quality of the product they are purchasing. This perception may or may not be in alignment with the actual quality (when compared to specifications) of the product. Nevertheless, in the end, it is this perception that carries much more weight than how well you are able to meet customer requirements. A lean manager understands this and finds ways to obtain customer feedback on quality perception. We also look at cost in two ways; what the customer is willing to pay, based on the perceived value of the product, and also internal cost within your nursery. Similar to Quality, a lean manager must not only work to drive internal cost down, but find ways to increase the customers' perception of product value. Delivery can be defined as transfer of a quality, right priced product at the right time, but also as internal delivery between process steps in your operation. Meeting external customer schedules starts with meeting your own internal process cycle time expectations.

Waste reduction may be the single largest lean component that can provide the most improvement for an organization. Typically, we think of nursery waste as either product not sold due to reductions in demand, unsaleable product due to quality shortcomings, or plants which may become damaged during processing. Waste in a lean system carries a much larger meaning. Waste, or "muda" in the Japanese language, relates to any general waste; scrap product, employee wait time, or wasted movement of people or products. Waiting is a very obvious killer of efficient production. Nobody is really keen on paying employees to wait. We pay employees to work! Identify the root cause that is driving this wait time, and fix it. Look for ways to improve the efficient movement of your most valuable resource; your employees. Try to address the placement or proximity of needed supplies to your workers. Other obvious concerns would be excessive movement, twisting and/or bending, transfer of items between hands and inherently unsafe movements. Generally speaking, any movement that an employee considers difficult or unsafe will be performed in a much slower fashion.

Another effective instrument in the lean toolset is "mistake-proofing", or "poka yoke" (loosely translated: avoid mistakes). Understanding that inspecting to catch defects before they leave your nursery will never be 100% effective. To this end, it makes sense to avoid making mistakes in the first place. The idea behind poka yoke is to use methods to, ideally, prevent an employee from making a mistake in the first place or from accepting a mistake or allowing a mistake to leave the operation. In a manufacturing operation, this may include use of non-symmetrical parts. For the green industry, realistically, this technique can be used to reduce the number of human errors by developing a system of visual cues of expected results, training materials and/or stops to prevent defects from moving on to the next process or leaving the nursery. Basically, find ways to visually show your employees what is acceptable and what is not.

The number one reason that Lean projects fail or never live up to expectations is leadership. Managers must learn that in a lean system, the focus is rarely on short term goals, putting out fires or meeting today's production objectives. Effective leaders in a lean system focus on long term goals, finding root causes to issues and fixing them for good and changing the way employees view their role in the organization. People mistakenly assume that a lean implementation will change the culture at an operation or company. You must remember that the culture at your nursery is the result of employee experiences under the current management style. Change the style and you can create a new culture over time.

**SUMMARY**

I will share what I consider the five most important lean principles.

1) Eliminate non-value added activities: Be sure to question all activities that you perform. Don't take anything off the table. Everything is fair game for three questions… Why do we do this? Does it add value? Is it something that our customer is willing to pay for?
2) Order will drive efficiency: Studies in human behavior have shown that the human

eye is drawn to chaos. As an example, when we drive past an automobile wreck, we have to slow down and look; we can't help it. If your nursery operation is cluttered with items not needed, your workers cannot get to the items/supplies they need without "slowing down to look" at the chaos.

3) Improvements = Profit: There are two ways of looking at your nursery operation in terms of Business 101. Typically, business owners look to set the selling price asked for their product as their costs + profit margin. However there are many other variables that drive selling price (customer perception, economic climate, …) and, in many cases we have less control over the selling price than we may think we do. In a lean world, instead of looking at cost + profit = selling price, you should consider selling price a virtual constant and define profit as selling price – cost. In this scenario, decreases in your costs have more of a direct relationship to profit.
4) Movement ≠ work: Never confuse movement of your employees with work. Busy looking employees always shuffling around may indicate inefficiency and wasted time. Remember that work should be defined as something that adds value to your product. Movement without added value is potential waste.
5) Management style drives culture: Many organizations implement a lean system in hopes of changing the culture. The fact is, if you want to change the culture within your operation, you must change your management style and expectations. Remember that the best you should hope to get out of your employees is your minimum expectations. So set the bar high, give reasonable expectations and hold employees accountable.

## General references


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