

Lean Techniques at Bailey Nursery®

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Lean is a business philosophy that focuses on eliminating waste in a process or program. These lean practices can then be employed to dramatically improve profits leading to greater customer and employee satisfaction. Bailey Nurseries Management Team embraced the concept of lean management in 2008 by bringing in a facilitator/coach to conduct training at both of our Minnesota and Oregon divisions.

Lean management requires that your finished product be observed from the customer's point of view. Is the customer willing to pay for all the steps in your production process? Some of the steps that improve the product are things the customer wants and is willing to pay for. They are referred to as "Value Added." If some of the steps are a waste of time and money in the customer's eye then they are considered "Non-Value Added." There are some "Non-Value Added but Necessary" steps that include such things as EPA regulation, accounting, taxes, OSHA guidelines, shipping, etc. All costs will fall into one of these three categories.

Waste refers to all steps or processes that do not add value to the final product or service. There are eight forms of waste that must be reduced or eliminated in order to improve the efficiency of a process. They include over-production, waiting time, unnecessary transportation, over-processing, excess inventory, wasted motion, production defects, and disinterested employees.

A tool that is used to meet the goals of lean management is called "Kaizen." Kaizen is a Japanese concept that means "Acontinuous improvement" or "change for the better." It is a focused effort on a particular part of the operation. When doing a Kaizen, a team of people looks at every aspect of a particular process and identifies the waste. Subtle changes to reduce waste in a process can make dramatic changes to the efficiency.

A Kaizen begins by determining the Takt time of a particular process. Takt time is the maximum time it takes to produce a product in order to meet demand. It can be calculated on virtually every task in a business environment. It is determined by using the formula: $Takt = \text{Available time} / \text{Demand (or units per day)}$.

If the production schedule for softwood cuttings is 5 million cuttings per year and those cuttings must be stuck between May 15th and August 1st, then the Takt time is calculated as follows:

Production Time:

Shift time (8 h)	480 min
Breaks 2 @ 10 min	20 min
Stretching exercises 2 @ 5 min	10 min
Production time per day	450 min
Working days (15 May – 1 Aug.)	× 58 d
Total number of working min	= 26,100

Cuttings to produce	5,000,000
Divided by total working minutes	26,100
Takt time	= 192 cuttings stuck per minute

The second step in a Kaizen requires that the team observe the people as they work and define their work sequence. These are the steps in the process that the crew goes through to complete their task. The Kaizen team must time each step and determine whether it is value added or non-value added. When areas of waste are identified, the Kaizen team discusses the options and begins to change the process to make it more efficient and eliminate the waste.

In 2008, the propagation department at our Yamhill, Oregon Division began to question the efficiency of one of its most basic processes, sticking softwood cuttings. There seemed to be a lot of wasted (non-value added) time in that particular process. Cuttings were stuck in ground beds inside a greenhouse structure. The rooting medium was tilled and leveled prior to being planted. The crew worked its way away from the end of the greenhouse where the automated irrigation equipment was parked. They used kneeling pads and worked on top of the very space they would be planting next. The crews created more work for themselves by packing the rooting medium down as they worked. The Kaizen revealed that approximately 50% of their time was spent loosening up the rooting medium and re-leveling it prior to sticking the cuttings.

A four-person Kaizen team was formed to evaluate this process and try to improve its efficiency. They began by measuring the Takt time of each step of the process. Next, an analysis of the results led the team to conclude that it would greatly improve the efficiency of the sticking crew if they did not have to "re-fluff" the medium prior to sticking the cuttings. A recommendation was made to build a cart that would allow the crews to ride above the ground beds and leave the medium undisturbed. Spending money on equipment is not usually part of a Kaizen event unless it is the only alternative. In this case, it made sense.

Our equipment fabrication department agreed to build a prototype cart. Once the cart was built, it was tested in the greenhouse and new Takt times were obtained. The results were very encouraging and then the benefit of Kaizen began. Minor changes to the design of the cart showed continuous improvement to the overall efficiency of the process. With input from the sticking crew workers, a simplified design proved to be very efficient. In 2009, four carts were built and tested under real propagation greenhouse conditions. Two crews worked simultaneously in the greenhouses. One crew used the carts and the other planted cuttings using the old method. The results speak for themselves. Labor to stick softwood cuttings was reduced by 40% using the carts versus the old method. In 2010, nearly 100% of the softwood cuttings were stuck in the greenhouses by this method. Only one crew of eight people plus one crew leader were used to plant all of the cuttings in the same amount of time that used to take two and sometimes three crews of the same size.

A Kaizen event should theoretically never end. Subsequent modifications to the process have included the construction of a hose cart to move the "watering in" hose, leveling equipment for smoothing out the propagation beds, and a very simple and efficient row marker. Minor changes with continuous improvement have greatly improved the efficiency of sticking softwood cuttings at Bailey Nurseries. The em-

employees are also happy with the improvements because their work routine is much simpler and they are not as tired at the end of the day. As an added benefit, with less soil compaction, it makes harvest easier resulting in more root fiber being retained on the cuttings.

There are a few things to watch out for when conducting a Kaizen event.

- Do a lot of research prior to initiating lean management techniques. It may be advisable to hire a professional trainer to help facilitate the first Kaizen.
- Make sure that management gives their full approval to applying lean techniques to their operations.
- State the purpose of conducting a Kaizen to the work crew and communicate the goal of the project.
- Empower the Kaizen team to take full control of the process they are analyzing. They are now in charge of every aspect of that particular process. Some crew leaders may have emotional ownership of a process and will resist change. Everyone needs to “buy-in” in order to make this process work.
- Establish visual control of the process. Post the results of crew’s activities. This can be on an hourly or a daily basis, but you must measure and post results or your time is wasted.

Calculate the financial impact your changes have made to the company.

There are several advantages to conducting a Kaizen event.

- It is low cost. Time is the major investment.
- It is targeted at specific bottlenecks in your operation.
- The results are almost immediate.
- Employees are more at ease.
- Results increased profitability with less waste of valuable resources.

The method of sticking softwood cuttings at Bailey Nurseries is somewhat unique. This article is not intended to convince your nursery to adopt this method. It is, however, intended to encourage you to give lean management and Kaizen a try at your nursery. You may find that you can eliminate some of the wasteful steps in your processes, which will help with your profitability and improve your employee’s work experience.

QUESTIONS AND ANSWERS

Steve McCulloch: How has the process of lean management started to change the culture of your team?

Jim McConnell: If anything it’s made us stronger. Since you’re pulling people from all over the nursery, you’re making new relationships. Everybody’s beginning to look at the processes that we do and maybe pointing out other areas that could use a Kaizen. It does pull you together. And, once in a while it alienates someone. We’ve lost a few people along the way too.

Angela Anderson: I’m just wondering whether the device you built causes any neck strain?

Jim McConnell: Not that we’ve seen. If you compare the new process with the old one, it is a hundred times better. There’s no back strain. That was the big issue before. The laying-down position is much easier on the back.