By Mike Lee

The green industry has seen its share of business fads and trends over the years. Most nursery and greenhouse managers today have a “show me” attitude towards the latest and greatest idea to come down the pike.

“Lean” is not a new concept, but it’s new to the nursery industry. With exotic terms such as “kaizen,” “sensei,” and “takt time,” it’s understandable that nurseries are taking their time to embrace the management system.

Bailey Nurseries has adopted Lean, and this is an account of a kaizen event (translated “continuous improvement” event) held at Bailey Nurseries Yamhill, along with the results.

In the spring of 2008, Bailey management elected to bring in a kaizen facilitator/coach to conduct training at our Minnesota and Oregon operations. The event was a week long “train the trainer” session, with the goal of empowering each attendee to conduct future events within the company.

It is worth noting that the trainer’s goal for our events was a 40 percent reduction in labor. That statement caused more than one set of eyes in the room to roll, but later we found that the goal was achieved or surpassed in every case.

One of our first kaizen events was held in our propagation department, and the task was sticking softwood cuttings.

Establishing a pace

A key component of Lean management is determining the takt time for a particular job or operation. “Takt” is a German word referring to the beat or rhythm of music. In manufacturing, takt time provides a watermark for matching the pace of work with the average pace of customer demand. The formula for calculating takt time is time available divided by sold units.

At Bailey, 90 percent of our softwood production is vertically integrated; demand for production elements is determined by the next stage of production within the nursery. So in this case, the “customer” is the next operation. Thus, figuring takt time requires integrating the window of time that the plants dictate is available for optimum rooting.

At Yamhill, the production schedule for softwoods is approximately five million units. Sticking of cuttings takes place May 15 to Aug. 1, a total of 58 working...
days. During each eight-hour day, we have two 10 minute breaks (required by law) and two five minute stretching sessions at the morning start and after lunch break, giving an actual work time of 450 minutes per day. The takt time for our cutting schedule is calculated as follows:

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\text{Working minutes per day:} \quad 450 \\
\text{Times number of working days for softwood production:} \quad \times 58 \\
\text{Total number working minutes:} \quad = 26,100 \\
\text{Units (cuttings) to produce:} \quad 5,000,000 \\
\text{Divided by total working minutes:} \quad \div 26,100 \\
\text{Takt time (rounded up):} \quad = 192 \text{ cuttings per minute}
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Time observations

In order to identify waste in a process, a team must perform time observations. This is where the team goes to the actual place the work is being performed and records every action the workers are making. Before this could be done, however, the kaizen team had to unanimously agree on the types of work conducted during the time observation phase of the event. We agreed on three:

- **Value Added (VA):** Activities that change raw materials into product a customer is willing to pay for.
- **Non-Value Added but Necessary (NVABN):** Functions that are a necessary part of doing business, such as payroll or OSHA and EPA compliance tasks.
- **Non-Value Added (NVA):** Unnecessary motion, transportation, excess inventory, waiting on cycle time. This is also known as “waste.”

Four team members set out one summer afternoon in 2008 and did time observation of a sticking crew. We found that one of the more challenging aspects of performing a kaizen is having workers perform at a “normal” pace, knowing they are being observed. Meeting with the crew and asking them just to pretend the kaizen team isn’t there to watch every movement had little effect.

It was important, though, to state the purpose of the event and communicate its ultimate goal of making the
workers’ jobs easier and less stressful.

Since the cycle time of sticking one cutting is short, the study was done in 5 minute intervals. The total number of cuttings stuck was recorded, along with the value added (sticking) and non-value added work that was performed. Cycle time data was recorded for the better part of an hour. The cutting crew was going to switch plant varieties during that time, and we agreed that the more data collected would result in establishing a better baseline.

What the data told us is the sticking (VA) time was 50-55 percent of the crew’s activity during the study. Our challenge was addressing the NVA waste time in the procedure.

At Bailey Yamhill, our propagation model is simple but fairly unique in the trade. Softwood cuttings are rooted in pumice-filled beds that are 6 feet wide, four across per structure. Mist, irrigation, chemigation and fertigation are provided by programmable traveling booms.

The crews begin sticking at the origin end of the house and work back, away from the boom. In doing so, they work over the prepped pumice into which they need to stick cuttings.

The NVA time was mainly dedicated to fluffing and re-screeding the pumice they worked over. If sticking could be performed without disturbing the media, we believed it could be possible to nearly double output.

Making carts

The idea to develop some type of moveable platform to keep the workers off the media was an answer. However, there were several parameters we had to work within when addressing this production issue.

The four two-person crews had to move simultaneously through the house. Varieties change frequently and the beds across the entire house had to be even to meet mist/watering needs. The walkways are concrete block and narrow – about 16 inches – and each

What is Kaizen?

Kaizen is a Japanese word referring to a philosophy or practices focusing on continuous improvement in manufacturing, business activities, and even life in general. The term typically refers to activities that improve a specific process within a business, whether in operations or the business office.

Kaizen involves a broad range of stakeholders in an organization – from the CEO to assembly line workers. By improving standardized activities and processes, kaizen aims to relentlessly focus on customer value and eliminating waste. Value is that portion of a product or service a customer is willing to pay for. Waste is that which the company pays for.

A typical kaizen team consists of:
- Outside facilitator/coach
- Cross section of staff
- Crew leader or foreman directly involved with the operation
- A customer, vendor, other nursery grower

Some advantages of kaizen:
- Low cost, low tech. The major investment is time.
- Employees and vendors have an enlightened view of your business.
- It will be specific to your operation.
- Measurable results can happen in a short period of time.
- Less stress and fatigue equals a better working environment.

Some challenges to consider:
- Emotional ownership of a process can become a barrier to improvement.
- Workers may fear losing their jobs and resist the process.
- It is difficult to work “normally” during a process observation.
- The new, improved process should become standard work.
- Leadership must have complete “buy-in” for Lean to be effective.
- Kaizen is ongoing: management takes on responsibility for follow-up events.
bed had to be easily moved in and out of a house by two workers.

After modifications to several prototypes, a basket cat or buggy with four fixed BMX bicycle wheels was put into use. It was an interesting process, in that our fabrication shop first made a fancy model, then the sticking crew proceeded to strip it down to essential components.

Four of these carts were built. Each carried two workers and had a rack in the middle that held two flats of prepared cuttings, enough for about one hour’s worth of sticking. Material and labor costs for the buggies came out to about $400 per unit.

Now, capital expenditures are the last action a kaizen team is to take. However, in this instance the team’s conclusion was that no other options were available.

Two full-time sticking crews work on softwoods during the summer at Bailey Nursery. We took the conservative approach and outfitted one crew with the carts and the other crew was our control for the season following the standard procedure.

After the first week the carts were put into use, the results were pleasing. The cart crew stuck 1½ times as many units as the control group. By season’s end, the gap had widened to nearly a 2½ times ratio!

Four additional carts have been built for the 2010 season based upon the season-long performance of our trial crew. Although this was a conservative approach, the net result is a more even workload for our full time skilled and trained work force and decreased need to hire seasonal workers to cover peak demand.

Perhaps the greatest payback of all was noted by propagator Steve Aime, who said, “My crews are going home happy at the end of the day.”
The Farwest Show introduces the New Products Showcase, a dedicated display on the 2010 show floor.

To qualify, non-plant products must have been introduced into the U.S. market in 2009 or 2010 and must be available for sale by a Farwest Show exhibitor.

Submission form and details are available at www.farwestshow.com/nps.

**Submission deadline is May 1, 2010.**

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