

*Lean Flow, Lean Production, Lean Manufacturing are the names of workflow systems developed and used by manufacturing companies for many years to, among other things, improve their efficiency and the quality of their products.*

*Scott Langlois is an industrial systems engineer who teaches these concepts at Mississippi State University in the US. He spoke at the IPPS Conference in Christchurch last year and outlined some of the principles behind the Lean system, a system which he says is applicable to nursery production. This article is based on his presentation*

## Lean Production and its application to the nursery industry

**L**EAN FLOW and Lean Production concepts are applicable to nurseries, Scott Langlois, an industrial systems engineer who teaches these concepts at Mississippi State University, told delegates at last year's IPPS Conference in Christchurch.

Their basic premise is to do more with less and to deliver quality to the customer at lowest cost. Companies in many different types of industries have been investing heavily in Lean Production for many years but it is really just starting to be adopted by the nursery industry around the world.

The Lean system has its roots in history, said Scott, but aspects of it first came to prominence in the US with the car assembly lines of Henry Ford.

US statistician, author and public speaker, W Edwards Deming, was an advocate of the types of disciplines it promoted but his message fell on deaf ears in the US. It wasn't until after World War 2 that Japanese manufacturers embraced Lean (called by various other names at the time) with enthusiasm and it is credited for much of Japan's post-War economic revival. It is also the

reason why there are Japanese names for many of the processes central to Lean. Toyota is known as the company which took Lean to its extreme and its production methods are synonymous with it.

"Lean is not necessarily about reducing labour or resources but it is about taking a good hard look at all the activities and processes in your operation and getting rid of the stuff that adds no value to you or your customer," said Scott.

"We're talking about trimming fat literally. Bottom line – Lean provides you with a structured approach to getting better and bringing improvement to your operation. I think it can be used anywhere."

While Lean principles came originally out of the manufacturing sector nursery people when they think about it might agree that what they do is similar to manufacturing.

### The 5 S's of Lean

- 1. Sort**  
Separate the necessary from the unnecessary. Keep only necessary items in each workplace
- 2. Set in order**  
Arrange needed items in an orderly fashion to promote efficient workflow
- 3. Shine**  
Keep work places clean and orderly
- 4. Standardise**  
Where possible, develop and follow standard procedures
- 5. Sustain**  
Develop a shared set of values among the entire team

might do you a lot of good, but what if you've only got 15 minutes available? Even doing the 15 minutes is going to make you that much better and Lean works kind of in the same way."

So, how to get started?

A starting point, said Scott, is to 'Sort' – separate the unnecessary from the necessary. Get workers to analyse and discard from their workstations, no matter where they are in the production process, anything that is not essential for them to do their job.

"You may not think that processes take longer where there is clutter, but I promise you they do take longer," said Scott.

"You have all probably visited nurseries where everything is in order, tidy, clean, well sorted, not a lot of junk lying around particularly around the workstations. And you would say 'Man, they really run an efficient operation!' And you say that without really knowing if they're efficient all not.

"In fact the perception that they are efficient because they just look like they are I think would be spot on. Keeping a nursery clean and tidy is going to drive efficiency anyway."

Introducing standard work practices is important. Scott said some of the best nurseries he has visited over the 12 years he has been at Mississippi State University are those that have standardised their work processes.

"Typically how do we train nursery workers when we bring some-



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**How is product moved around your nursery? Is manual handling the best answer? Right: eliminate wasted time: main job of the man in this picture was originally just to carry full trays of cuttings into the greenhouse – now he also sticks cuttings while he waits for trays to fill**

body on board? We say: 'you'll hang out with Joe, he's been here for five years, he'll teach you everything you'll need to know.'

"Well, how was Joe trained? Joe hung out with Bob because Bob had been there six years and Bob taught him everything that he knew.

"But go further back upstream and you'll find it started with you, the business owners, expressing your expectations of quality for the product you're manufacturing or that you're producing.

"Things tend to get lost in translation and when they are handed down from worker to worker to worker and you will be missing out on establishing what your expectations are.

"So, share with your people a standard set of instructions so that everybody gets the same message and is doing things the way you want."

### Eliminate waste

Eliminating waste is all its forms is a central Lean theme.

"In our nursery industry waste typically is thought of as products you can't sell. Maybe something you've hung on to for a while, maybe something that you don't have a market for any more or plants that maybe have become damaged through handling or environmental conditions.

"Basically, anything that ends up

in that dump out the back is waste right? In the Lean world that is regarded as waste too, but only one of many types of waste that Lean identifies.

"In the Lean world waste is defined as any non value-added process. So, anything that you're doing to a product while it's in your nursery is up for debate about what value is really has.

"I define 'value' as something that the customer would pay for. So, anything that you're doing that your customer doesn't want to have to pay for is potentially non value-added and a candidate as an activity that you can get rid of.

"I do understand that you have to do some things because of plant physiology, or other things that the customer does not care a lick about, like regulations, but what I'm saying is to use the non value-added criteria as a guide against which to test everything you do and if you don't have a really good reason why you need to keep doing it, probably you can get rid of it.

"Lean actually identifies seven different types of waste, but we are only going to look at a few here. One of them is 'Waiting.'

"Waiting can be waiting on supplies. I see it all the time at nurseries where you've got workers that you're paying to manage a certain process or perform a certain job but

instead of doing that they're busy out gathering supplies.

"Nurseries have solved this in different ways. There's a term used in the Lean world called 'kanban.' Kanban is a signaling system that is triggered when stock levels or part numbers fall to a point and tell a manager or worker that something needs to be done. Some nurseries may have an employee who is only busy 70 or 80 percent of the time. They make them use this time availability to re-stock supplies for other workers that are busy 100 percent of the time. And that helps a lot."

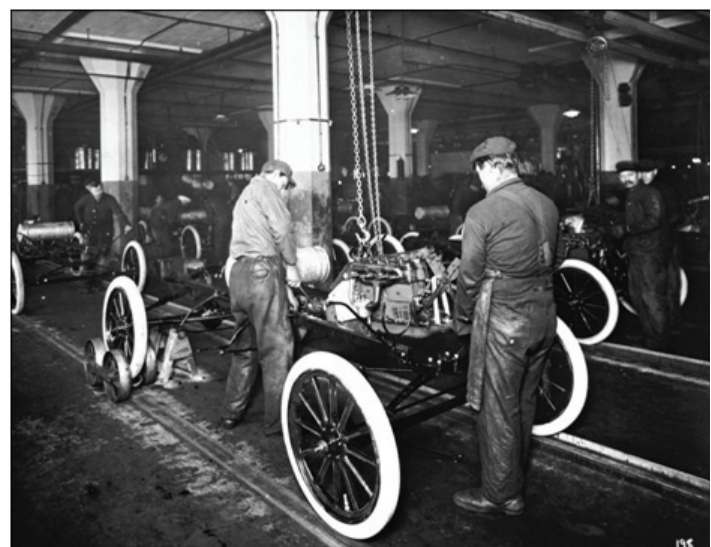
Waiting can also be workers wait-

ing for the people ahead of them in the production process to finish what they do before they can start, or waiting on items from a prior process.

"I saw an example in a nursery I visited recently. These ladies were working out in the open on a trailer sticking cuttings and there was this fellow whose only job was to take the stuck flats and bring them into the greenhouse and sit them on the floor.

"And that was great. He could keep up with their output with no time waste. But as they moved closer to the greenhouse he had a lot of time availability. He would bring

**The Lean system has its roots in history, but aspects of it first came to prominence in the US with the car assembly lines of Henry Ford**







**Modern conveyors are great for nurseries, says Scott Langlois. They're lightweight, have low power consumption, stack up nice and neat on a trailer for transportation and set up in no time . . .**

a tray in and set it down, he'd come back and he'd wait and wait then grab another one and go and set it down.

"Very simple problem to solve. What they did was they taught this guy to stick cuttings and although he's not as good as the ladies, he is now busy 100 percent of the time. I thought that was pretty cool."

Another kind of waste is Motion Waste where workers have to move unnecessarily to do their jobs.

"Take a close look at the proximity of the items and supplies that your workers are using. Make sure they are not using excessive movement, reaching, twisting, that sort of thing, and that everything they need is really close to them.

"You might also notice that whenever a worker grabs this or that they immediately change it from one hand to the other because that's the hand they need it in. Very simple to fix but a lot of times it's just allowed to continue.

"I don't know how workers would

handle this sort of thing in New Zealand but back home typically with the immigrant workers that we have, they're going to keep using the workstation as you set it up for them. So if you put some of their supplies 20 feet away, or on the wrong side and they're going to have to twist, they are probably not going to change that. Here your workers might take the initiative and make the change themselves, I don't know."

## Safety concerns slow people down

"Another thing to be aware of is that if workers feel that what they are doing is even slightly dangerous they will slow down while they're doing it. So, look for things that, while they might not be so unsafe that you'd get written up for it if you were audited, are a little awkward for somebody to do. These things will probably involve a waste of motion.

"Another type of potential waste is transport waste. How do you

move product through your nursery? During the pre-Conference tour here in New Zealand I saw some pretty innovative ways of using conveyors.

"Conveyors are great and we've been promoting their use for years. They're so lightweight now and have very low power consumption. They stack up nice and neat on a trailer that you can hook behind a tractor to go wherever you need them and set up in no time. Particularly good when you're filling greenhouses with potted material."

Scott talked about the Japanese concept of poka-yoke, which is a basic of Lean manufacturing. It refers to designing into a machine or process any procedures or constraints that prevent mistakes or incorrect operation by the user.

"These are things that you do to mistake proof your operation. In the manufacturing world there are hard poka-yokes, an example of which would be parts that will only fit together one way. It's a little tough to do something like that in our industry. But we can do things that are 'soft' poka-yokes.

"This could mean just adding some signage. Or it could be using special colours to signify different things that go together.

"A nursery was having problems with ornamental grass liners being planted too deep. It just put up pictures showing what the proper depth should be. Also in their grading process they actually laid some of the products out at the workstations to show workers examples of a Number 1, Number 2 grade and so on."

Scott said the Number One reason Lean projects fail is management. "People don't understand that you have to kind of evolve your management style when you undertake Lean to make it work.

"Typically we pay our supervisors to be pushers I think, most of the time, to will things to happen. We say 'we are going to get 10,000 cuttings stuck today, do whatever you have to do to make it happen.'

"Now, towards the end of the day, we find we've only got 6,000 done – so we throw more workers at it. A Lean approach is more concerned with the long term. Why are we only at 6,000? We've got the capability to do 10,000. A Lean approach might say 'let's take a step back and see what we're doing

wrong' instead of just throwing more people at it so that we make the 10,000.

"The Lean approach recognises that every part of the organisation has to share in problem resolution. There are probably not many processes at your nursery that aren't impacted by or impact themselves on to other processes. Everything is inter-related and you have to recognise that."

## Five principles to take on board

Scott finished his presentation by summarising some of the other principles central to Lean.

### Number 1

"First thing is, question everything that you do. Everything is fair game, take nothing off the table, look for the real reasons why you do things, and look for activities you can eliminate.

"So, Principle Number 1: eliminate non value-added activities."

### Number 2

"Behavioural studies have shown that the human eye and brain are attracted to chaos.

"As we're driving down the road we pass a broken down car or wreck, what do we do? We slow down and look. Why do we do that? Because we have to, it's just the way people are made.

"So if you've got workers who are having to reach around and sort through stuff that really doesn't belong at their workstation, they are going to slow down and look, just like we do when we're driving down the road; we can't not do it.

"So, Principle Number 2: Order will drive efficiency."

### Number 3

"We're taught in businesses such as ours that the selling price of our products is equal to whatever our costs are plus whatever profit margin we need to survive.

"And that's ok except that it makes the assumption that we control our selling price – which we really don't. I mean, selling price is based on so many things, customer perception, economic climate, environmental climate, phase of the moon – all these things go into play to determine what that selling price is.

"In a Lean world, instead of looking at cost + profit = selling price, you should consider selling price a

## Keeping the workplace clean and orderly is a central theme of the Lean Manufacturing system



virtual constant and define profit as selling price minus cost. In this scenario, decreases in your costs have more of a direct relationship to profit.

"So, Principle Number 3 – improvement can equal profit."

#### Number 4

"I used to work with this fella years and years ago, he would buzz around like a bee, he was moving all day long, he never sat down. When we had visitors to our operation they'd say 'you're so lucky to have a guy like that. He's the hardest working guy you'll have.'"

"Now, those of us who knew him, knew his only two redeeming qualities were that he walked fast and he looked nervous. And that's all he brought to the party."

"Principle number 4 - don't confuse movement with work. Work adds value to your product, movement without value is a potential waste that you need to take a look at."

#### Number 5

"If you want to change the culture within your operation you've got to change your management style. The best that you can hope to get out of people is your minimum expectations, so remember to set the bar high and hold people accountable."

"Principle Number 5 – management style drives culture."

#### Change is essential

"Earlier I mentioned a fellow by the name of Deming. He is long since dead now but one time when he was talking to a group of business leaders in the States on the topic of change."

"He was saying that you really need to embrace change, you need to accept change if you ever want to get better. One fellow, who was a very successful business leader stood up and said 'I'm very successful; I've been doing the same things for a long time. I don't think I need to change. In fact I'm not going to change.'"

"And Deming's response was this: 'you're right. You don't need to change. Survival is not mandatory. Keep doing what you're doing and hope that, as successful as you are, there's not one other person out there in this world somewhere doing the same thing as you but trying to do it better, faster and a little bit cheaper . . .'"



*NZ Alpine Lavender is the largest certified organic lavender farm in the southern hemisphere*

## Top lavender oil from the high country

**B**LAKE FOSTER and Allan Tibby have carved out a champion lavender oil-producing farm on the stony plains of the Mackenzie Basin, 600 metres above sea level

Blake Foster has contemplated putting a warning sign on State Highway 80 that reads "caution, purple distraction ahead."

For visitors to the Mackenzie district can now stop and smell the lavender – all 99,000 or so plants of it.

Situated on the Mt Cook Highway, New Zealand Alpine Lavender is the largest certified organic lavender farm in the southern hemisphere.

"One local customer commented he had not been to Mt Cook for years and just about drove off the road when he saw all the purple colour in the paddock," Mr Foster said.

#### Skills and a dream

The enterprise was born from the combination of Allan Tibby's vision and Mr Foster's skill set. Mr Foster was inspired by his long-time friend's dream and believed his practical skills would form the perfect partnership.

The lavender is grown at an altitude of 600 metres, which they believed is the reason their oil is some of the purest and most potent in New Zealand.

Mr Foster grew up on a cropping farm in Saskatchewan, Canada, and was familiar with breaking in new land, picking up stones, driving tractors, and working in the fields.

The Mackenzie Basin had a sim-

ilar climate to Saskatchewan although it was not as cold, he said. Once the decision had been made to develop an organic lavender farm, Mr Foster spent six months in 2009 carrying out extensive research.

He met lavender farmers in New Zealand and Tasmania and, in spring that year, planted a trial plot of 600 plants from three different

*By Sally Rae  
Otago Daily Times*

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