1ST IN A 3-PART SERIES **Next month: Size doesn't matter.**

Here are 10 problems that occur in many greenhouses that could be resolved by implementing Lean practices.

By Gary Cortés and Dave McPhetrige

Top 10 signs your business isn't Lean

WHEN OBSERVING ACTIVITIES in your greenhouse operation, do you often see:

- A flat-filler operator or sticking/transplant belt off-loader worker not working half of the time.
- Production volume dictated by belt speed.
- Stickers/transplanters that work fast, except at product changeover.
- Order pickers who make one trip to each greenhouse per truckload.
- Shipping boxes, pallets or racks that can't be loaded onto trucks until the last greenhouse pick is done.

If any of these occur regularly, then your operation is a prime candidate for Lean.

Top 10 signs you need Lean

1. You create prefilled containers.

Flat-filling produces excess capacity. It outruns transplanters and stickers. So why do growers maintain pallets of prefilled flats and pots? And why do propagators inventory stacks of prefilled plug or cutting trays?

Taking a batch approach, workers pull the day's orders from the greenhouses onto carts, rolling benches or conveyors. These order pullers must finish early, so another group can rearrange the pulled product into preconfigured shipping racks or pallets.

Order pullers could be kept busy all day by assigning them to weed, sweep, clean up or do something else productive.

By prefillings pots or flats, you think you're ahead for tomorrow. When tomorrow arrives, for whatever reason, the workers can't stick the cuttings or transplant the plugs scheduled. Now you may have prefilled the wrong pots or flats or maybe they were filled with the wrong growing media. Pallets of pots or flats are now blocking aisles, taking up valuable space.

2. Flat-filler operators are underused.

It takes 25 percent of a person's time to load and run a flat filler. Sure, the operator does other things like mixing soil, moving completed products or getting more cuttings. This person also does a lot of walking because flat-filling equipment is a physical barrier.

What else could this employee do? Pre-nest pots in flats — one flat at a time — before loading them in the flat filler. This is minimal walking and value-adding. He'll need a roller conveyor like the one sitting upstream of the flat filler. He'll need a pallet of pots and flats nearby. Now, he's filling the containers that need to be made. This should be what can be made today, not a guess at what will be needed tomorrow. Somebody else, not the landlocked flat-filler operator, does the material handling.

What else could the flat-filler

Each person in this cutting sticking line plants 25 or 33 percent of the tray depending on the tray size. Transplanting is done off the belt, which can yield a 20-percent improvement in productivity.

operator do if he wasn't trying to produce a day's worth of prebuilt flats? What seemed like a good business decision to keep people busy instead perpetuated poor work force use.

3. The belt speed sets the pace.

Watch closely employees working at a sticking or transplanting belt. Some aren't working as fast as they would like while others struggle to keep up. Speed up the belt and quality suffers. Slow it down and everybody works too slowly and productivity drops.

The solution is to take this work off of the belt. Two things happen: Productivity immediately and permanently increases by 15-35 percent and each employee works at an optimal, comfortable speed. A team, not a belt, paces the work.

4. Individual incentive pay endangers quality.

If you use a conveyor and individual-worker incentive pay, all of the employees are sticking quickly, because their individual bonus is significant. But their work quality is poor, and two (non-incentive) supervisors are at the end of the belt to fix mistakes.

Incentive pay combines well with Lean Flow, as long as incentive pay is for a team, and the measure is for good output, not raw (cuttings, plugs, etc.) input.

5. Changeovers consume valuable production time.

For 10 minutes per changeover, six changeovers per day and 15 production workers, you've lost 900 productive minutes.

Two Lean Flow steps solve this problem. First, plan tomorrow's production (products and quantities) in what sequence. Second, use a professional material-handler.

The primary responsibility is staging materials one job ahead, based on the production plan.

These packing lines are very simple. Boxes are made on an as-needed basis and not a day's worth. Both lines operate during peak packing periods.

This keeps stickers, transplanters and container fillers working. Changeovers drop from 10 minutes to 1. The material handler may also address problem No. 6.

6. You have a poorly used sticking/transplant off-loader.

The last person on the belt moves the completed product to a cart, bench or wagon. Typically, this person, who is only 50 percent used, rarely assists effectively with sticking, transplanting or tagging.

Two Lean Flow steps resolve this. First, each off-belt line can do its own offloading. Second, this person can now be the professional material handler (what he was doing in the first place, but not too efficiently).

7. One greenhouse pick "wave" is made per truck.

Five trucks loaded per day means five long trips through the greenhouses to pull the same product. Lots of travel and time with no value-added. The product could have been picked in one trip, but you've already weighed that option.

The Lean Flow solution is a kanban-driven "supermarket area" next to the shipping area. Kanban is a Japanese word for signal.

Truckloads are staged out of the supermarket. When a product reaches a certain low level (trigger point) in the supermarket, workers pull more from the greenhouse. How much more do they pull? Maybe a day's worth, depending on perishability. That's determined by a combination of pre-books, availability, plan week and weather.

The key is planning every week and every day. Planning is better than maintaining a large greenhouse-picking work force.

8. You use prebuilt shipping boxes.

This situation mirrors the prefilled containers described in problem No. 1. The Lean Flow solution is to use a box builder in a "feeder" line, who is always just a box or two ahead of shipping.

The common argument with this setup is there is no way a box builder can keep up when workers are packing. All you need to know is how much time it takes to make a box and how many boxes have to be made today based on the shipping plan. Lean Flow algorithms (a procedure or formula for solving a problem) make sure there is not only enough space to work, but also the proper resources available to staff

the station.

If greenhouse product picks are consolidated to avoid multiple pick waves, many boxes are needed all at once at the end of the day. This leads to problem No. 9.

9. A truck can't be loaded until the last pick is complete.

Each truck might need an unobtainable plant from a distant greenhouse. These plants won't get to shipping until late in the day. Then employees will quickly perform the stressful dance of boxing, palletizing, racking and loading.

The Lean Flow solution is once again to use the supermarket described in problem No. 7. It's easier, more space-efficient and less time-constraining to configure and load trucks from a nearby supermarket of products, organized by product. This is better than trying to offload product from greenhouse carts to preconfigured shipping racks.

10. You dread peak week.

Upset truck drivers. Impatient customers. Out of racks, out of space. Everyone's exhausted. People are making mistakes and a few workers are suffering injuries. Peak week is survived through brute force, determination and lots of pizza. This is expensive, inefficient survival.

Talk to employees at a greenhouse that has implemented Lean Flow. They'll likely tell you that they didn't even realize peak week had come and gone. They enjoy a reasonable, comfortable pace every day, every week. Their customers receive the right products at the right locations on the right days.

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Lean Flow Workshops are scheduled for Oct. 14-15 in West Palm Beach, Fla., and Nov. 13-14 in Denver.