

Impact of Lean Flow Techniques on Plant Production[®]

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INTRODUCTION

Spring Meadow Nursery, a propagation nursery with over 20 acres of greenhouses, is located in Grand Haven, Michigan. All propagation is done asexually, by cuttings, in-house. Much of our production involves direct sticking cuttings in their finish tray sizes of 32 or 18 cells.

In 2009, we had a goal to increase labor efficiency to stick cuttings by 15%. We had a good system with trained, hard-working employees, mechanization that included a flat filler and a dual-line conveyor system that supplied medium-filled trays to workers and transported stuck trays through a watering tunnel. So where was the 15% gain in efficiencies to come from?

Historic average rate for sticking per person for 32-cell trays was 24-cell trays per h. The rate included non-sticking support jobs such as manually loading trays into the flat filler and transferring the finished trays to the greenhouse floor for rooting.

METHODS AND RESULTS

We hired FlowVision, the Lean Business and Supply Chain Consulting Group, to help us reduce our labor costs company-wide. This was a significant investment by Spring Meadow in terms of money and time to learn lean production techniques and to track and quantify improvements on a daily and even hourly basis.

2009 Methods and Results. First year (2009) production improvement resulted from inexpensive changes:

- Standardization of tasks.
- Frequent communication with crew workers on goals. This included feedback from the workers, not just one-way communication.
- Improved work flow with emphasis on material handling. Most important was eliminating any delay for required materials such as cuttings and flats.
- Improved labor tracking. Times to perform each job were measured and recorded, using a stopwatch, to get an average time for every job on the line, including support workers. Exact rates were then determined.
- Attention was paid to flex jobs — jobs involving two or more functions — which have a huge impact on productivity.
- Changed from individual incentive bonus to a group bonus to reward support workers too.

As a result, our 2009 productivity increased 13% for 32-cell trays and 32% for 18-cell trays. Approximately half of the savings for 18-cell trays was due to increased use of sticking multiple cuttings per cell to increase rooting success.

2010 Methods and Results. Lean flow techniques call for continuous improvement:

- We re-configured the work area to allow for improved work flow.
- Purchased overhead conveyors to bring medium to the flat filler so that the cumbersome soil mixer could be removed from the work area.
- Changed from individual sticking stations to progressive sticking, using three people to stick flats in an assembly-line fashion.
- Advantages of progressive sticking:
 - Easy to train new people. Trainees are placed in the center position and receive instruction from workers on both sides.
 - Crew workers like it. They compete as a team and the work is less boring because they are not sticking an entire flat.
 - Slower people are pushed to become faster. The slow person is put in the center and is pushed by the first person and the end person. There is a lot of peer pressure to achieve the goals so that everyone can earn incentive bonus pay.

CONCLUSION

Record of productivity increase from 2008–2010. Quantities are average trays stuck/person/h as a group.

Tray type	2008	2009	2010	Total productivity increase
18 cell	31.4	41.2	44.9	43%
32 cell	24	27	30.7	28%