

How To Automate Perennials

Learn how adding automation helped improve efficiency, save money and grow profits at Riverbend Nursery.

By Jim Snyder

Increasing efficiency — that is what this article is all about. You might be thinking, well, who made Jim Snyder the expert on efficiency? I'm the first to say I'm not an expert, but I'm always looking for a new idea I can use — whether it is a new type of irrigation head or a \$100,000 piece of equipment. I am also a firm believer in continually experimenting with and implementing new ideas and equipment to achieve the ever-elusive state of efficiency.

When it comes to achieving greenhouse efficiency, there are advantages and disadvantages of automating your production operations:

Advantages:

- Generate a consistent, predictable output of product.
- Create a pleasant working environment for employees.
- Improve information gathering and recording.
- Save on labor.
- Employ fewer people.

Disadvantages:

- Outlay of resources/money and space.
- Need for employees with greater mechanical skills.

Consider Your Options

Automation of planting perennials is different than that of annuals; primarily, when planting annuals the runs (or amount to be potted into a single size at one time) per variety tend to be long (tens of thousands) and in perennials the runs can be short (less than 1,000 units) and the variety wide. Obviously, there are exceptions to this. Also, there is a range of plug sizes.

While I plan to discuss various levels of automation, I cannot emphasize enough that many increases in efficiency require no automa-

tion. They require constant observation and an open mind. Here are a few ideas that have struck me as possibilities for my nursery:

- Plant-placing fork
- Field marking tool
- Homemade tray washer
- Organized display/cutting beds
- Stacked pots

Automation Levels

Automation — it need not be as complex and costly as you might imagine! I have broken the topic into three levels: simple, moderate and complex. Most automation projects are modular so you can start simple and add pieces without reworking the line to reach the level you desire over time.

Simple. I begin with a flat filler line, which is comprised of a stand-alone machine that fills pre-made flats to a uniform level and compaction. Flat fillers can be portable. The simple layout includes an infeed conveyor and a soil-filling machine. From here one can palletize, transport to the site, plant and place with reasonable efficiency.

We did this for years, and it works well to a certain point of production. We found that as we got larger, we were running around distributing plugs, pots and crews, and the necessary number of managers it took became a little too much.

Moderate. The moderate system builds onto the flat filler at the point of output. It includes an infeed conveyor, a soil-filling machine, a dibbler or drill, a 5-6 person transplant conveyor, a water tunnel and an accumulator conveyor. In tandem with the filler, the dibbler provides a hole to manually insert the plug into as the flat goes along the transplant line.

We started with a filler and added a transplant line two years later. In addition, using a water



Automated potting equipment allows for proper spacing of pots during production. (Photo: Riverbend Nurseries)

tunnel after the transplant line will thoroughly saturate and settle the plug into the pot. Not only did the water tunnel do a better job than we could by hand, it also saved watering time and helped in washing off the excess soil prior to going into the coldframe and contaminating the gravel with surplus soil media.

The accumulator conveyor at the end of the line maintains the constant speed of production, preventing starts and stops in between wagonloads. This simple addition adds efficiency.

Complex. Doing many short runs and close to 2,000 varieties, like we do, can add complexity. For an annual grower with large runs of each plant, automating may not be as complex.

The complex layout includes an infeed conveyor, a flat/pot dispenser, another infeed conveyor, a soil-filling machine, a dibbler or drill, a transplanter, a fixing station, a water tunnel and an accumulator

Being a grower that sells to independent garden centers and landscapers, we sell all of our plants individually. Therefore, we grow individual plants in individual pots in shuttle trays. I did time studies to see what I spent each year putting pots in trays and the numbers were staggering. In Europe they do it automatically, why can't I? The big difference is they grow in round pots and we grow in squares, but even more importantly, pot quality and configuration become an issue.

Plastic pots handled mechanically need a lip around the edge or space between the pots within the stack. We had quart and gallon pots made

to meet this criteria. By adding a pot dispenser in line, I project to cut three people off the line.

Adding A Transplanter

So far we have only discussed manual planting of plugs into the finished container, but there are many companies offering transplanters that will automatically transfer the plug from the plug flat to the finished container. There are even some new machines that offer planting from plugs into individual pots up to 7 inches in diameter for growers that do not grow in flats.

To this point, I have addressed plug potting and have not discussed those products produced from bare root liners or large plugs. There are various types of machines used for this. The standard is the fill and drill method or

the carousel method.

One greenhouse I know uses a very common fill and drill unit. A simple yet effective way to pot is with a carousel potting machine, which is primarily a pacing mechanism. One can add automatic, individual pot droppers to these machines and take-off conveyors to improve efficiency.

Plant Transport

I have addressed assembling the pots/flats, potting the plant and efficiently watering it — where to now? Let me touch on plant transport. Here are several choices:

Pot robot onto rolling pallets/benches. The robot picks up and puts down pots from a conveyor belt and places them on a transport bench. It is an efficient and reliable automatic operation.

Benches transported on wagons. This is a rolling pallet/bench system that is moved in and out of the field on special wagons. The pallets are brought in from the field then rolled into a central area for shipping as well as from potting to the field. The base wagon has a wheel guide on the roadway to ensure alignment of the two.

Internal Transport System-trolley. This type of transport uses an overhead rail system. This is the ITS (Internal Transport System) by Visser. The products are loaded on a battery-powered trolley and sent on their way.

Europe tilt bed. This homemade device is used to transport flats from the production area to the growing area and lay down automatically. Pretty clever and cost effective.

Visser Space-O-Mat. This option is a little more expensive than the previous but allows for spacing of the pots and picking them back up. A word of caution — these work well on flat terrain

in wide, open houses/areas.

Cavachio Greenhouse pot forks. This is an example of a similar concept of the two previous transport ideas, again homemade and cost efficient. These forks are used to transport product from the production area to the field — very cost effective.

Conveyors. We have found that the use of portable conveyors has really cut down on labor. Instead of needing four or five people to load, we cut it down to two or three. We use these in Quonset-style coldframes.

There also are a number of growers who have run permanent conveyor systems into gutter houses for plant movement, but these growers use these houses for a range of crops, not just one or two turns of perennials a year.

Conclusion

Progress begins one step at a time. I am a firm believer that when one company progresses, it is good for all companies in our industry. I have an open and sharing attitude when it comes to Riverbend, and I have been extremely impressed by the open and sharing attitude I've found at the many greenhouses and nurseries I have visited. It is that kind of open attitude that allows us to be the great industry we are. **GPN**

Jim Snyder is president of Riverbend Nursery, Riner, Va. He can be reached at (540) 763-3362.

This article is adapted from the Perennial Plant Association 2001 Proceedings.

LearnMore

For more information related to this article, go to www.gpnmag.com/lm.cfm/gp040602

Before Automation

When considering automation, it is important to create a master plan with or without the help of an expert. Some of the things to take into account include:

- Crops grown
- Quantities grown
- Methods of product handling
- Facility layout
- Drawbacks
- Budget and financing options
- Priorities
- Savings and payback
- Training requirements
- Future needs



This is Your Association

Member benefits include floriculture education, networking resources, professional development, and public awareness.

www.ofa.org



Write in 792

AUTOMATION: RAPID HAS IT!

Conveyors



Transplanters



Pot Dispensers



Taggers



ALSO:

- Labeling Equipment
- Fillers, Bale Breakers
- Mixers, Water Conveyors
- Soil Lines
- AND MORE

RAPID
AUTOMATED SYSTEMS, INC.

RELIABLE • AFFORDABLE • SIMPLE
Jenison, MI

Call for more info:
616-662-0954 www.rapidautomated.com

MADE IN THE U.S.A.

Write in 762

Quality is Beautiful

Donahue's



Now Offering Finished Clematis

DONAHUE'S CLEMATIS

Inventory still available for Spring 2006 shipping!

Contact your favorite broker or contact us directly at:
Faribault, MN 55021 • Phone 507.334.8404 • Fax 507.334.0485
Or e-mail us at donahue@donahuesclematis.com

Write in 756