Pot-filling machine saves time

If you pot up more than 20,000 plants a year, consider purchasing a pot filling machine to speed the work and save wear and tear on your workers.

Pot-filling machine at The Flower Factory, Stoughton, WI.

How does it work?

A pot-filling machine drops soil from a hopper down into the pot as workers manually set the plant. There are different types and sizes of pot filling machines. The simpler ones consist of a soil hopper which you fill with soil. An electric motor powers a conveyor with paddles that continuously raises soil and drops it into a chute. A worker places a pot under the chute and lets a little soil fall in to cover the bottom of the pot. Then he or she places the transplant in the pot and returns the pot to the platform to be filled with soil. The worker puts the pot on a tray and gets the next pot to fill. Most models are designed to recycle the overflow soil. Some pot filling machines accommodate a range of sizes such as 4.5" to 3 gallons; others take a specific size pot. These machines work best on a hard, level surface, and require an electric power source.

Benefits:

Faster. If you fill pots by hand pouring soil from a scoop, you'll work faster with a pot-filling machine. One Wisconsin perennial grower reported saving over 1100 labor hours the first year they switched to machine filling.

Scooping and lifting soil by hand.

Profitable. Expect to pay $6,000-$16, 000 for a pot-filling machine. Using one manufacturer's design (the Javo "Unimax," which costs ~$16K) and one grower's actual time savings with a similar machine as an example, if your labor costs are $15/hour and you usually fill 50 thousand pots per year, you could pay off a Javo Unimax in about a year and a half.

Pot-filling machine, estimated payback period

Pots filled/yr	20K	50K	80K
Hrs. to fill pots by hand	457	1143	1,829
Hrs. to fill pots w/ machine	206	515	823
Time saved	251	628	1006
Labor costs saved at $15/hr	$3,765	$9420	$15,090
Payback period	4.3 yrs	1.6 yrs	1.1 yrs

Less fatigue and discomfort.

With a pot filling machine you eliminate the task of lifting soil by hand, and you shorten the time spent transplanting. Workers who scoop soil into pots for hours on end can suffer overstrain injury. Repeated use causes wear and tear on muscles and joints in the fingers, hands, wrists, arms, shoulders and neck. These kinds of injuries do not recover overnight, and can become chronic, leading to time off work, increased medical costs and reduced productivity.

Customize to your nursery.

Some nursery growers have purchased a pot-filling machine and made their own simple modifications to further increase efficiency. You can build custom workbenches to the left and right of the worker to hold bareroot plants and pots.

Pot filling machines come in a broad array of sizes and options, such as for bareroot nursery stock, flats, and as part of a larger mechanized system. A machine is usually not cost effective unless you pot up at least 20,000 plants a year. Make sure the machine you choose can handle the size pots you want to fill and the weight of your soil mix.

Convenient. Pot filling machines don't take up much space. Some are on wheels so you can set up near where you want your fin-- shed product and minimize the distance you carry potted plants. Usually the soil hopper has a wide opening at or near ground level, which makes it handy to fill with the bucket on a skid steer loader or tractor. Growers can reduce hand lifting to fill the soil hopper by carrying the bags with a skid steer loader or tractor bucket.

Even without a pot-filling machine, you can improve efficiency by studying task flow, worker comfort, and workstation height. The most efficient table height for a standing worker to pot plants is slightly lower than halfway between wrist and elbow, measured when the arm is held down at the worker's side. Workers using a hand scoop to fill nursery pots with soil for tree seedlings found that changing from sitting on a stool and working on the ground to sitting on a chair at a table could improve their efficiency by 12% and reduce backache and leg cramp complaints[1].

Where do I get one?

These references are provided as a convenience for our readers. They are not an endorsement by the University of Wisconsin.

Pot-filling machine sources

Company/Distributor	Notes
Calzavara, distributed by Agrinomix, Oberlin, Ohio. 1-800-354-3750 www.calzavara-italy.it [C07 Nursery Potter]	Put soil in hopper and paddles on a conveyor continuously lift it up. Place pot on a screen table and it fills with soil. Foot pedals control soil conveyor and vibrator below the filling bench. Designed for containers 8"-15" in diameter. Has wheels. From Italy.
Javo USA Inc, Kennesaw Georgia, 1-800-usa-javo Javonl.com [Javo Unimax]	Put soil in hopper and paddles on a conveyor continuously lift it up. Place pot on platform and it fills with soil. Excess soil is recycled. Fills wide range of pot sizes. Place for two workers, but no workstations supplied. Has wheels. Made in Holland.
Demtec, distributed by AgriNomix , Oberlin, Ohio 1-800-354-3750 Demtec.eu.com [DT mini]	Put soil in hopper and paddles on a conveyor continuously lift it up. Place pot on screen table and it fills with soil. Excess soil is recycled. Fills wide range of pot sizes. A worker can stand on either side of screen table, but no workstations supplied. Foot pedal on/off. Has wheels. From Belguim.
Pack Mfg. Co. McMinnville, TN 931-473-9980, Packmanufacturing.com [½ yard Batch Mixer w/Potting Table]	Soil hopper has an auger mixer. Hopper is 3' off ground on legs with castors. Separate table next to hopper has cut-out area with platform below for a pot. Hopper discharges soil onto a conveyor which moves soil to fill pot. Excess soil falls to tabletop or floor. Also distributed by Agronomix

This material was developed by the Healthy Farmers, Healthy Profits Project, whose goal is to find and share work efficiency tips that maintain farmers' health and safety and also increase profits. For more information, call (608) 262-1054 or visit our website at ***http:// bse.wisc.edu/ hfhp/***

Authors: Astrid Newenhouse, Marcia Miquelon,and Larry Chapman, Department of Biological Systems Engineering, College of Agricultural and Life Sciences, University of Wisconsin, 460 Henry Mall, Madison, WI 53706.

Sources: [1]Ole-Meiludie, R. E. L., and Pamba, G. K. 1988. Time study on different techniques for nursery pot filling operation. Silve-Fennica 22(2):171-175

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