GROWERTALKS

Features

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Transplanting More Efficiently

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The purpose of an automated transplanter is to automate the tedious, repetitive and labor-intensive task of extracting plugs from a plug tray and planting them into flats, pots or baskets that they're grown and sold in. All but one design use some form of grippers, fingers or other mechanism to extract the plug from the tray and plant it into flats, pots or baskets.

Basic design differences

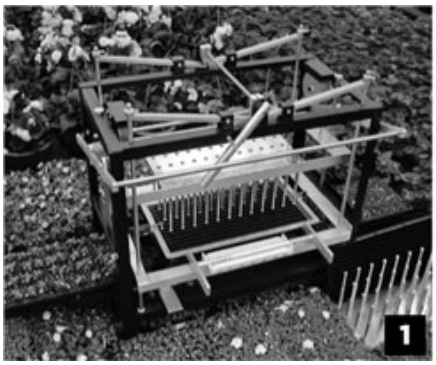
There are two major differences when it comes to the gripper/finger technology used to pick up the plug: the "finger/pusher pin" design and the "needle" design.

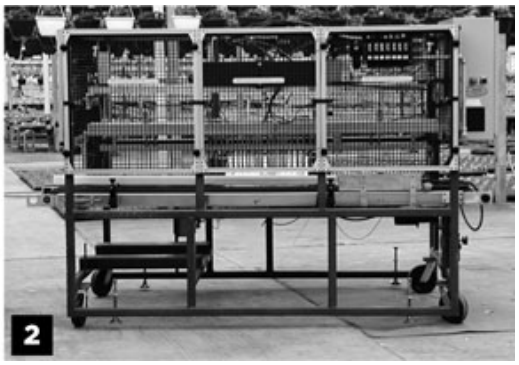
The finger-type design uses four fingers and a planting foot that allows the gripper to make a side shift movement to get under the foliage and a pusher pin that's synchronized with the extraction of the plug to insure all types of plugs are extracted, whether they're underdeveloped with no root structure or overdeveloped with lots of foliage and roots that tend to adhere to the side walls of the plug tray. The planting foot is utilized to ensure that the plant is pushed off the fingers during planting, which makes certain the plant is placed at a consistent and proper depth. In most cases, pre-dibbling the flat or pot isn't necessary.

The disadvantages include the need for an ejector system, which requires hardware and time to change over. The finger-type design allows the operator the advantage of changing out the size of the gripper to fit the size of the plug.

The needle-type design uses a system of four needle-like grippers that extend from a choke tube to insert into the root ball and pick the plug out from the top. The needle design may or may not have an ejector system on the machine. The advantages of this system include operation without an ejector system, which makes for faster changeovers. The disadvantages include possible increased damage to some varieties of plugs and the inability to pick up underdeveloped and overdeveloped plugs. Typically, this design uses a one-size-fits-all, non-interchangeable gripper that may only allow the machine to pick up every other plug within the plug tray because of the larger design of the gripper that doesn't let the grippers get close enough together for the smaller plug trays' (512 and 288) cell spacing.

Pictured: 1 & 2. Today's transplanters range from the simple (left) to the sophisticated, with speed, capacity and flexibility to fit almost any grower's needs.





Impact of transplanters

What's the payoff time for the machine? There are several factors to consider. Labor savings is the most common consideration. If a machine is fairly priced and you select the right unit for your operation, two to three years is a reasonable amount of time for you to realize the labor savings equal to the amount of the original investment. Some larger growers have been able to see payoff in only one year.

There are other areas that have a payback; however, they're more difficult to calculate the savings. Transplanters can actually do a better, more consistent job transplanting than most humans. Because of that, the finish time can, in some cases, be shortened by five to seven days.

Another savings that's difficult to calculate is the ability to continue to transplant a second or third crop while most of the workforce is involved in shipping out your first crop. Transplanters have helped many growers stay on schedule, allowing them to get those additional crops planted—which, in some cases, is where your profit for the year is. This also allows delivery of promised product at crucial times.

Many growers have noted that the transplanter sets a steady pace for their crew. It keeps everybody moving who's involved in the transplanting process because the machine is going to keep cranking out the product. There's no time to stand around and chat. At the same time, it makes their jobs easier (given an ergonomically efficient system setup with the transplanter).

Transplanting affects your whole operation. For instance, most machines plant best when the plugs are at their optimum size. Because it's easier to stay on schedule when you don't have transplanting and labor bottlenecks, your plugs have a much better chance of being transplanted before they get overgrown in the plug tray. This results in better quality in the end. Germination is very important as well—the fewer missed plug cells, the more efficient your transplanter will be. These things in turn will make the grower better at growing and the manager better at planning and managing.

In the past, the start of the season was a ramping up process, with the initial filling of the greenhouse taking several weeks. This mindset has changed with the addition of automated transplanters. The first generation of transplanters could produce 100 to 400 flats per hour. The current generation of transplanters can produce 300 to 1,000-plus flats per hour. This gives the grower the ability to put off heating the greenhouses for up to two to three weeks, and the cost of firing up heaters and boilers in January and February can be substantial.

Advantages

- Delay the start of your season; this can reduce your initial labor and heating costs
- Planting time for your initial greenhouse fill is greatly reduced
- More consistent planting
- Reduced loss of plugs
- Quicker grow out, as plant stress can be greatly reduced
- Back-fill time is greatly reduced; when you start shipping, you can send two to three people to operate the transplanter and start back filling the greenhouse as soon as the space opens up
- Improved reliability
- Improved performance by employees by eliminating a time-consuming and repetitive task
- Large growers can see a reduction in seasonal employees and some small growers have eliminated seasonal employees all together
- Reduction in overtime and weekend production

Disadvantages

- Initial investment cost
- Selecting personnel for maintenance training
- Operator training
- Maintaining inventory of expendable parts
- Yearly maintenance or preventative maintenance provided by supplier

Purchase considerations

When selecting a machine for your operation, consider the following:

- What is the rate of flats per hour and how many people are needed?
- Do you want an inline system (directly in line with a flat filler) or the flexibility of a portable unit? Most operations may have already installed a manual line and an automated transplanter can be dropped into an existing line. Most transplanters give the operation the ability to run the automated line as a pass -through manual line. But, if an additional manual line is necessary, then keep this in mind.
- How versatile does the transplanter need to be? Don’t buy a Cadillac if a Chevy will do. Usually, more bells and whistles require more technically minded people to operate and maintain the equipment. A human is very versatile, but don’t expect this type of versatility in a machine. The more versatile a machine becomes, in most cases, the more costly it will be. As a machine becomes more versatile, its ability to do any one thing greatly decreases. When considering versatility, look at your production schedule. What advantage does a machine capable of doing hanging baskets present if this production is coinciding with flat or pot production? Consider that large containers with few plants take more time and effort to fill, put on hangers and transport than it does to plant. Consider what the most efficient use of the transplanter is.
- Do you have one or two people who will be responsible for the equipment? Will they be sufficiently trained and able to keep things running?
- How will you bring material to and from the transplanter? After purchasing the transplanter, the next thing needed is an efficient way to handle the flow of material after transplanting. Look at the overall picture

and develop a workable plan.

- How will a transplanter work in your system? A transplanter is a sizeable investment. It needs to work in your system or you need to be willing to change some or all of your system to work with it. Talk with other growers and equipment companies and formulate a plant to make everything work together. Don't look at any one piece of equipment by itself to solve all of your efficiency problems. If you have an $80,000 transplanter, but are filling your flats with a wheelbarrow and shovel, you won't be very efficient.
- Is the transplanter upwards compatible? If you purchase a transplanter of a certain size, can it be easily upgraded in the future and not require you to purchase or trade in for another transplanter?

Ask around

What's the reputation of the product and company you're considering? As with any major purchase, you should check references. Ask growers who use this equipment questions including: Does it measure up to its advertised capabilities (e.g., rate per hour, ease of use and reliability)? When it breaks down (all machines eventually have a problem of some sort), what's the tech support like. Are parts readily available? What problems have you experienced and how were they resolved? Is the machine simple enough for you or one of your current staff members to maintain or did you need to hire additional technical staff? Check a manufacturer's track record for repeat customers. When the need arises, does the grower purchase additional transplanters from the same manufacturer? **GT**

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