

Increase Production with a Transplanting Conveyor

John Bartok, Jr.

Extension Agricultural Engineer

If you employ four to six transplanters during the spring, it may pay to install a transplanting conveyor system. The system contains the conveyor and any or all of the following: dibble, tagger, watering tunnel and storage conveyors.

Prefilled flats, either from a flat filler or purchased, are loaded into the supply conveyor. Here they are dibbled to punch holes in the growing media for the transplants.

Dibbling

A variety of dibblers are available, with the simplest type comprised of a board with nails or pegs fastened to it. A worker presses the dibbler on each passing flat, creating holes for the plants. The dibble board can be fastened to a foot pedal to make the job easier.

A fully automated dibbler is air or hydraulic operated. A photoelectric eye senses an approaching flat on the conveyor and stops the flat. The dibble board drops on the flat to make the holes. It then rises automatically and the flat continues onward.

Transplanting

Two types of transplanting conveyors are available. In the first, transplanting personnel work on one or both sides of a slow moving belt conveyor. As the flats move by, each worker sticks seedlings into one portion of the flat. The seedlings needed for transplanting are located within easy reach of the workers. A plug dislodger may be used to loosen the plugs to make removal easier. The speed of the conveyor can be varied to adjust for different flat sizes and worker speed.

In the other system, workers sit at tables attached to the side of the belt conveyor. Unplanted flats are supplied from a roller conveyor located above the conveyor belt or from a pallet behind the worker. Plug trays are placed adjacent to the transplant flat. Each worker transplants a full flat and then pushes it

onto the conveyor belt. This system can utilize workers of different skill levels.

Tagging

Once transplanting is completed, the conveyor moves the flats to the tagger which places consumer sales tags in tray cells or packs.

While the tagger may be a worker placing the tags by hand, automating machines are better if the volume of plants moving through the system is high. Taggers can be set up to handle flats or pots in different configurations.

Watering

A watering system can be located before the dibble if the media is dry or after the tagger to settle the mix. The system can be as simple as a set of nozzles located above the belt and connected to a water hose. Control is usually a solenoid valve activated by a microswitch or photoelectric eye. Watering tunnels are available from several manufacturers.

At the end of the line, the flats or pots may accumulate on a section of roller or belt conveyor to the growing area.

When to Automate

It requires at least six workers to develop an efficient mechanized transplanting system. This system can frequently double the output of the same workers working on a bench. The payback can be as little as 10,000 flats/year.

To determine how much to spend on a transplanting system, look at each task or operation. Is an automated dibble necessary or can one worker handle the dibbling as well as loading the flats onto the conveyor? At the other end, can one worker place the tags and load the flats onto carts for movement to the growing area?

The cost for a conveyor transplant system varies. If you want to fabricate your own system, look to spend from \$2,000 to \$3,000 for a used conveyor and parts. A new commercial system with automated equipment may cost as much as \$50,000.

With transplanting being one of the most labor-intensive operations in a greenhouse, it should be one of the first to be considered for mechanization.

