automation
answers

Transplanting Efficiency

Automating your transplant line can mean much more for your company than labor savings.

By Mike Porter

Today, automation is everywhere in our society — or better put, the use of technology is everywhere.

During the Christmas holidays, my mother-in-law walked into the house one day with a remote-controlled Santa robot that held a tray designed to bring your favorite holiday beverage. It reaffirmed to me that almost anything a person thinks of can be automated. But, obviously, the fact that something can be automated is not sufficient reason to do it.

The only reason for a grower to automate is to improve their overall operation — an improvement that can be more than cost reduction. Improvements can also increase quality and response time. With all the equipment available in the marketplace today, many growers don't know where to start.

Every grower's operation is unique — be it their mix of plants, methods of shipping, climatic conditions, style of greenhouses, etc. However, some basic elements of the growing process are similar. Transplanting is performed by most growers, and it requires significant labor. Because automated transplanting represents a potential market, there are a large number of automated transplanters from which to choose; making automated transplanting economically feasible for virtually any size grower.

COMPONENTS AND TERMINOLOGY

Source trays and destination trays. Material is moved into and away from the transplanter by two conveyors that are synchronized with the transplanter. One conveyor handles the source tray — the tray from which the plugs will be removed for transplanting. The other conveyor handles the destination tray — the tray to which the plants will be transplanted. Not all trays are suitable for automatic transplanting. It is critical that the transplanter manufacturer preapprove the trays to be used. In addition, many growers use multiple versions of the same size tray. Reviewing the whole operation to minimize the number of different trays will reduce changeovers and greatly improve efficiency. However, computer technology has made such changeovers much easier than in the past.

Plant grippers. Plant grippers are the parts of the transplanter that pick up the individual plants or plugs and perform the actual transplanting. Because grippers handle the tender young plants, gripper design is critical to transplanter effectiveness. Gripper designs vary widely from manufacturer to manufacturer. Don't be afraid to examine the grippers on any prospective machine and use common sense and good judgment to guide you to the right design. Another key design element is proper control of the gripper positioning motion. Such control ensures that each plug is centered in the appropriate cell of the destination tray and will also ensure proper planting depth. Proper control often results in a greater number of saleable plants, an important consideration when justifying the cost effectiveness of a transplanter.

Transplanting capacity. The number of grippers and the length of the transplanting cycle determine the capacity. Transplanters are available with capacities ranging from 4,800-50,000 plants per hour. For optimum efficiency, the number of grippers used should be an even multiple of the number of source tray cells along either the width or length. For example, if the source tray is 10 cells wide, five would be an acceptable number of grippers; three would not. With three grippers, the machine would still have one row of plugs after making three passes from each source tray row. Another key factor in practical capacity is the number of hours per day the transplanter will be run. As with automation equipment in any industry, increasing the number of hours of operation per day may well allow a lower capacity, less expensive machine to be used, and reduce the payback period.

Economic justification. Transplanters are normally easy to justify from labor savings alone. As an example, a machine with a capacity of 4,800 plants per hour will normally replace 3-4 people doing manual transplanting. But other benefits should also be considered. Uniformity of planting location and plant depth result in improvements in quality and a higher percentage of saleable plants. During shipping season, when workers may not be available for transplanting, automation may be the only way to get that critical second or third turn. Transplanters will also "pace" your employees and establish a predictable output on a daily basis.

Automatic transplanters are a good starting point for automation but are only one consideration for a truly efficient operation. Next month, we will look at the benefits of a complete transplanting line and the benefits of a complete review of your total operating plan. GPN

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