Automated
Benching Systems

In the automated greenhouse benches are much more than just a place to grow plants.

By Mike Porter

Last month's article focused on options for material movement when growing on the floor, but what about growing on bench systems? Creating the proper environment for crops should be the single most important criterion when deciding on a production method, though in the past, economic or labor considerations have been the prime decision factors. The traditional view was that growing on the floor (without flood floors) was the least-expensive alternative and offered the most flexibility and that growing on benches cost more money but was more accessible.

Advances in automation technology have changed the traditional reasoning, making this more of a personal-preference decision. Flood floor systems and automated benching systems cost approximately the same, and automation exists for both systems that allows efficient use of labor and maximum flexibility.

BENCHING BASICS

When a grower decides to grow on benches, a mobile system should be seriously considered. These systems are available in varying degrees of sophistication. Many articles have been written on operations in The Netherlands where only four people are needed to operate a 4-acre range. The bench systems in these ranges are totally automated, and people, theoretically, never go in the growing range. I have seen one of these operations growing four acres of Boston ferns, and it was an extremely efficient operation. However, U.S. growers cannot make a living growing one crop with a 16-week cycle.

Automated benches can easily be moved from headhouse to production area with a simple manual cart (top) or an automated transport system (bottom).

Systems do exist that provide the American grower with an extremely efficient method for moving large amounts of product in a relatively short period of time without total automation. Automated bench systems can be designed with or without flood bottoms, allowing the benches to be both a transport system and an integral part of the irrigation system, from plastic or metal, with mess or solid bottoms, etc. The only real defining characteristic of automated bench systems is that the benches are designed to ride on a system of rails that allows them to be moved from the headhouse to the greenhouse and on to the shipping area. In many instances, the movement to and from the headhouse is done using a powered transport line, while the movement of the bench to and from its position in the greenhouse is done manually. It is possible for two people to easily move even a 20-foot bench. Because of this, any given bench can be placed in position on the transport line, providing the flexibility so crucial for the American grower. This manual movement is surprisingly quick.

To be most efficient, a bench system must be designed as part of an integrated system. The flow of the crops through both the greenhouse and the headhouse must be considered. Optimally, newly planted crops will enter the greenhouse on one end, and finished crops will exit the greenhouse on the opposite end, creating a circular product flow through the facility. The greenhouse itself must be sized to allow maximum space utilization. A properly designed system of bench and greenhouse uses space as efficiently as a flood floor system. The headhouse must be planned to allow for automatic washers for the benches as well as equipment to automatically load the benches. This supplemental equipment need not be part of the initial investment.

BENCHING IN THE FUTURE

One of the most exciting aspects of automated benching systems is the future potential. Technology is being tried in a greenhouse environment that uses bar coding to identify the location of every bench and describe the plant material on it, an invaluable aid in inventory control. This information can also be used to guide the irrigation equipment so that fertigation is unique to each bench.

Cynics may say that automation has made both benching and floor-growing systems very expensive. However, this is only true when looking at the initial installation cost. As with any automation decision, it is critical to look at total operating costs over the life of the equipment. When labor savings, efficiencies and standardization are considered over the life of the product, the cost is very reasonable.

With all the technology available, and the size of the investment required, how does a grower decide on the proper system? The keys to this decision are no different now than 20 years ago. There never has been nor is there likely to be a substitute for the instincts of the grower. See what others are doing, decide what you need, consult your manufacturer and trust your instincts. GPN

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