

sizeable labor cost saving since we did not have to dispose of the poly tarp. I also have data on the hand weeding dollar savings in the Basamid versus methyl bromide plots in 1986. Once again, we have a product from agriculture that is applicable to the nursery community.

If anyone is interested in testing Basamid-Granular and applying with an Orbit-Air Gandy Spreader, please contact me for spreader setting, tractor speed, and other data that will save you time in calibration.

## **MECHANIZATION OF LOADING PLANT MATERIAL: MOBILE LOADING DOCK AND TELESCOPING CONVEYER**

GREGORY JOHN LANGELEER

*Chesapeake Nurseries Inc.  
Pemberton Drive  
Salisbury, Maryland 21801*

Loading trucks from stationary docks using conveyers has been standard procedure for a long time. Both cost a great deal of money and are permanent fixtures of a loading operation. As our research into the applications of this technique at Chesapeake Nurseries began, we saw many problems with it.

The nursery was rapidly expanding and the demands of our loading system were changing. After many discussions, the idea of a mobile loading dock on a truck that could be moved from trailer to trailer as loading required was considered. A 50-ft. conveyer was considered necessary to load 40-to-45-ft. trailers used in shipping efficiently. We felt a moveable dock 50-ft. long would be at best very awkward and inefficient, but a 25-ft. truck would be very easy to move. We began to look into a way to build a 50-ft. conveyer that would slide together into 25 feet.

Our conveyer consists of three main components. The first is two conveyer sections, the top one 25 feet in length and the second 28 feet in length. The second component is the transition plate that allows plants to slide from the top belt to the bottom belt. The third key part is the dock itself. (See Figure 1).

The two conveyers were hand-built, and the bottom conveyer rolls under the top belt on 6 in. v-groove wheels. The conveyer is fully operational at any length from 28 ft. (fully closed) to 50 ft. (fully extended). Both conveyers are 18 in. wide and can carry up to 75 lbs. per square foot.

The transition plate is made of a high-density polymer with a low friction coefficient. As the plants come off the top belt, their



**Figure 1.** Above. Mobile loading dock and telescoping conveyor. Center. Loading dock with plant material. Below. Conveyor in use.

momentum carries them down the transition plate to the second belt.

In the nursery trade almost all equipment must be modified to fit each nursery's particular application. We feel this is also true of our conveyer system. This system offers a low-cost, highly efficient means to load plant material that can be modified as needed.

## **BEDDING PLANT PRODUCTION IN A "STATE-OF-THE-ART" ENVIRONMENT**

**BILLY POWELL<sup>1</sup>**

*Powell Plant Farms  
Route 3, Box 1060  
Troup, Texas 75789*

Because of its seasonal nature the bedding plant industry is a difficult candidate for automation. However, changing markets, labor, and the rising costs of production materials have many growers considering automation technology.

Powell farms of Troup, Texas, a bedding plant grower since 1958, started considering a high-tech facility in 1982. Their existing facility was too extensive and productive to replace, so the facility of range was designed to integrate with it.

In the process of design to accommodate the two type production systems, Powells avoided one of the major pitfalls facing growers switching to high-tech automation—automation bottlenecks.

An example of a common bottleneck is having one rolling table unloader with a capacity of 1000 flats per hour as the sole source of a supply for a conveyer truck-loading system with capacity of 3000 flats per hour, which would be needed during peak season. Unless the capacity of this table unloading system is increased, either by supplemental hand work or by mechanical means, there is a bottleneck. Powells' solution to this problem is leaving enough room around each system to accommodate the hand labor required during peak season. By doing this, each mechanical system can be operated at its peak of efficiency, year-round and overloads are quickly handled by temporary help.

One area in which this solution did not work was seeding. All seeds are germinated in plug flats, making hand seeding impossible. Also, accuracy required in seed placement coupled with the volume necessary to meet company needs ruled out temporary or

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<sup>1</sup>Paper presented by Bill Corbin