The most automated bedding plant range in the world?

The Netherlands' most high-tech bedding plant grower has automated to get three turns of bedding *and* cut labor

BY JOLI A. SHAW

What started as a traditional 2-ha nursery in the east of Holland has boomed into 14 ha of the most automated, innovative bedding plant production in the Netherlands, if not the world. Robots, transplanters and a new 25-bay shipping dock help Bennie Kuipers, Kwekerij Kuipers, Denekamp, produce and ship 6 million clayette 10 packs per year while at the same time cutting his labor force by more than half.

Bennie gets *three turns* of bedding plants, more than double the 1.3 to 1.4 average most Dutch growers get from their nurseries. He does this by transplanting plugs from 512-cell trays to 160-cell trays before transplanting into the final pack. Plants spend 80% of their culture time in plug trays. After planting into clayette 10 packs, finishing takes only two weeks.

Before automating, Kwekerij Kuipers needed 30 people per hour just to put handles on the clayette 10 packs. After having Visser design a machine just to put handles on packs, they have reduced the work force to 14 full-time employees. His goal is a labor cost of only 6½% for finishing large plugs once all systems are in place.

Efficiency outweighs costs

Construction on the 12-ha Denekamp location started about 4½ years ago and was scheduled to be completed by mid-February. Kwekerij Kuipers BV has two locations: the Denekamp range run by Bennie and a 2-ha plug nursery in De Lutte run by his father, who started the business.

Producing bedding plants is a big investment, says Bennie. Greenhouses for the 12 ha range cost about Dfl 150/m². Bennie has a solid 75% equity position, refusing to fall into the overleveraged trap that has consumed so many growers in Holland.

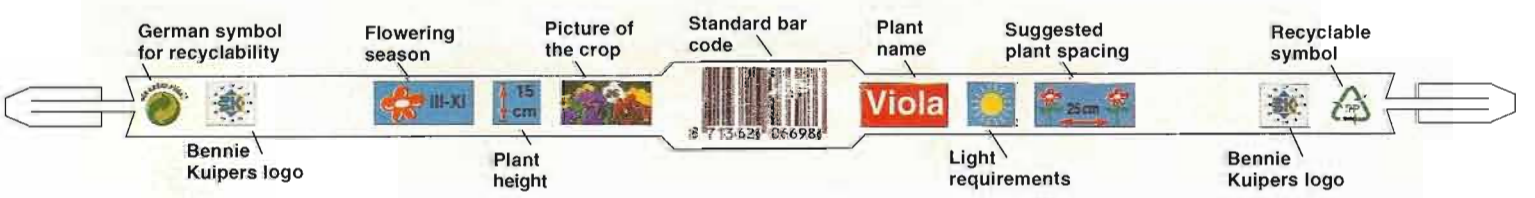
Bennie's cost for automating his bedding plant range: 6 million guilders (about $3.8 million). That includes four production lines (two lines for transplanting plugs and two lines to plant clayette 10 packs) with Flier and Visser transplanters and a Visser machine that puts handles on packs. In the greenhouses, two Flier robots move plants around inside bays and load and unload conveyors; another Flier robot waters, sprays and fertilizes; and two Flier flatbed robots bring plants into greenhouses and out to the shipping area. A new roller conveyor system for order assembly and a 25-bay loading dock complete the facility.

Bennie Kuipers, owner, and Ton Lowik, who handles finances and sales, Kwekerij Kuipers BV, Noord Deuringen, the Netherlands.

The heart of getting three turns of bedding lies in transplanting plugs. A Flier transplanter moves plugs from a 512-cell tray into a new 160-cell tray. Before using the 160-cell tray, Bennie transplanted once and used a 512-cell tray only. Manufactured by Synprodo, the plastic 160-cell tray is the first tray not made by Visser that is compatible with the Visser transplanter, which formerly accommodated only Visser's Star Tray. The 30x50 cm tray is notched at the upper edges of cells to bend easily and be more flexible.

After plugs are transplanted the first time, they are moved back into the propagation area instead of into the

Kwekerij Kuipers 10 pack handle



greenhouse. This way, they can be grown on closer together in the optimum growing environment for a longer period of time, about five to six weeks. Overall, bedding spends 80% of its crop time as a plug.

When 160-cell plugs are ready to be transplanted into clayette 10 packs, they go to a Visser production line that starts with a tray destacker and flat filler. A transplanter plants plugs from the 160-cell tray into a clayette 10 pack for finishing.

Because Bennie can keep plugs in propagation longer, plants are finished in only two weeks, giving him an extra edge in supplying the spot market with the right crop. He can also hedge the weather by holding plants longer in the plug stage without sacrificing finishing time.

After transplanting, clayette 10 packs go to a Visser machine that puts handles on packs. Bennie asked Visser to design the pack handle machine especially for him—it's the only one like it in the world. Kwekerij Kuipers' Clayette pack handles are brightly colored and enhance plant presentation at point-of-sale.

All product moves through a one-way circuit, from production into the greenhouses and into shipping. Battery-powered Flier flatbed robots move plants down the south aisle into greenhouses. A separate flatbed robot takes finished product out the north aisle into the shipping area. Each robot is assigned one job and does not duplicate another robot's responsibilities: One takes plants into the greenhouses, one takes finished plants to the shipping area, one sets out plants, one loads plants onto conveyors and one sprays, waters and fertilizes.

After the handle is attached, packs are loaded by conveyor onto a flatbed robot for transport into the greenhouse. Flatbed robots move along aisles with the aid of metal strips in the floors, guided by a low concrete wall.

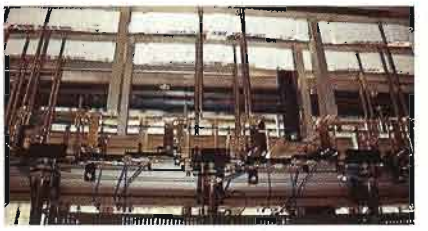
To move packs around the greenhouse, Bennie has two Flier robots that use hooks to pick up packs by handles and carry them in and out of the growing bays. One robot rolls over the top of the flatbed robot, picks up plants and brings them into the greenhouse for growing on. The other picks up finished plants from bays and places them on another flatbed robot on the other side of the greenhouse for transport to the shipping area. Each robot requires only one operator and moves up and down bays on tracks.

Another Flier robot equipped with 6,000 liter tanks lets Bennie water, fertilize and spray chemicals using one machine. It takes one person only five to six hours to water or spray 10 ha—about $2^1/_2$ minutes per bay.

Shipping and distribution

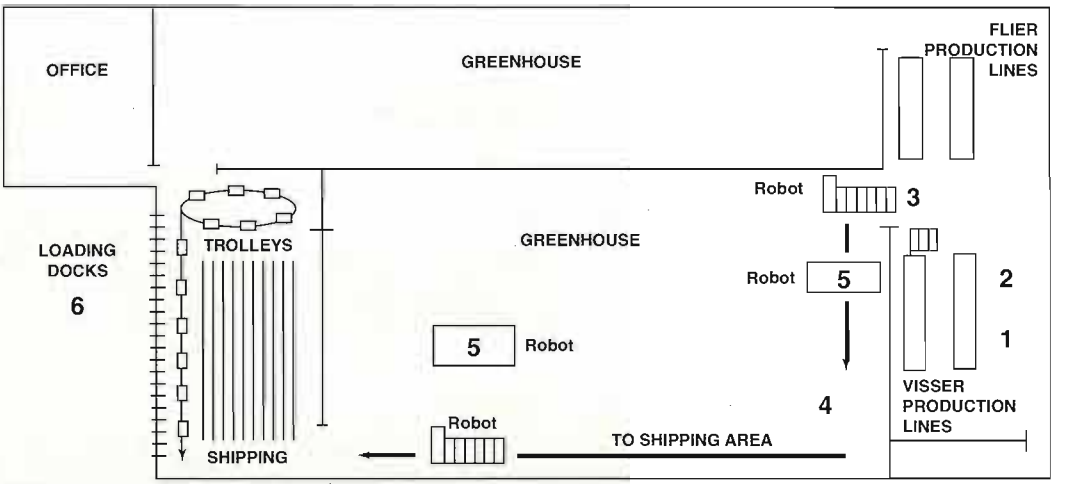
Kwekerij Kuipers' new distribution area will include 25 loading bays and 40 m of conveyors that run the length of the shipping house. The Flier flatbed robot will bring packs into the shipping area when they are ready for order assembly. The robot then feeds conveyors that run side by side across the ship-

Bennie uses two Visser lines to transplant larger plugs from 160 trays to clayette 10 packs at a rate of about 60,000 packs per hour. Two Flier production lines transplant plugs from a 512-cell tray to the 160-cell tray.



Visser pack-handle machines complete two of four production lines, automatically inserting custom-designed handles into clayette 10 packs. Before Bennie began using the machine he needed 30 people per hour to put handles on packs.

Two Flier flatbed robots carry packs from the production area into the greenhouse, then move them out to the shipping area after finish. Each can carry 700 10 packs at one time.



ping area. Each conveyor holds only one type of plant (impatiens, petunia, etc.), and order packers take appropriate plants from each conveyor to pack Danish CC carts.

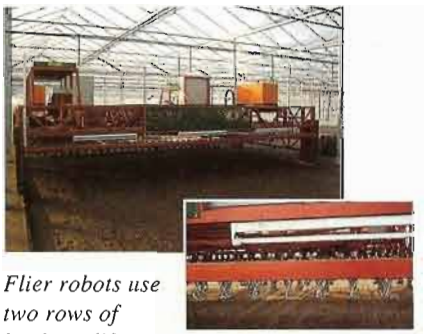
Carts are connected to an in-floor chain drive—the kind used at the auctions. They move forward slowly on the concrete floor like an assembly line, circling back to the loading bays where they are rolled onto trucks. Bennie says only five or six people will be needed to fill all orders.

Innovative marketing

Bennie came up with the idea for using the clayette 10 pack five years ago. Average price for the pack is $1.94 wholesale, $3.90 to $6.50 consumer price.

The clayette 10 pack has always come with a handle, but Bennie has recently improved his marketing with a brightly-colored, consumer-friendly handle that provides all of the information about the product. The handle includes a German environmental symbol for its recyclability (which Bennie has to pay for), the Bennie Kuipers

A 6,000 liter capacity Flier robot lets one person water, irrigate and fertilize the whole range using only one machine.



Flier robots use two rows of hooks to lift packs by their handles, loading and unloading flatbed robots and setting packs out in the greenhouse.

Bennie has constructed 25 truck bays in his shipping area to facilitate loading and distribution. Using CC trolleys to ship the clayette 10 packs, Bennie can put 25% more product on trucks than his competitors.

symbol, flowering season, plant height, a picture of the crop, the plant name, light requirements, plant spacing and a standard bar code that gives the European article number, the country of origin and identifies Bennie as the grower.

By employing innovative marketing tactics like the handle and keeping his eye on the bottom line, Bennie has managed his business to use automation as it is meant—to save money and labor. For Bennie, three turns of bedding is simply the beginning of a system that looks toward labor costs a fraction of the typical grower's. ■