

Bagging seeds like gold

Weigh/fill/bagging system provides 1-gram fill accuracy and better packaging for Heinz tomato seeds that sell for \$300 to \$1,500 a pound.

Jack Mans, Plant Operations Editor



Selling proprietary breeds of tomato seeds to growers is a lucrative and growing business for HeinzSeed, a division of Heinz USA. Heinz went commercial with its seed line in 1991, and sales will reach 70,000 bags of seeds this year. Bags, which are sized to contain exactly 150,000 seeds, weigh in the range of one pound, depending on the seed size, and sell for \$300 to \$1,500 each, depending on variety. Heinz had been packing the seeds into paper bags by hand and then sewing the tops shut. But, increasing sales made this impractical, so last year it installed a weigh/fill/bagging system from Weighpack/Paxiom. "We looked at a number of machines, but Weighpack/Paxiom

was best for our needs," says Gary King, HeinzSeed's regional manager-sales & trials. "It's very flexible and easy to operate, it's extremely accurate, it produces great-looking bags, and it wasn't as expensive as some of the other machines. Plus, we had to install it in a relatively small space and it has a very small footprint so it doesn't take up much floor space."

Heinz started doing its own agricultural research in 1915 and was the first company to become actively involved in tomato breeding experiments. It is now one of the leaders in this esoteric and highly technical field. The process involves hand-pollinating plants and then testing the resulting hybrids. "We conduct trials all over the world and actually sold 73 different hybrids last year. We look for field and factory yield, solids content, viscosity, easy-peeling and how the hybrid handles local growing conditions," says King.

The Packaging Education Forum announces that H.J. Heinz has been elected Packaging Leader of the Year (see page 78). More information on Heinz next month.

The prices of the seeds sound like a lot, but it takes at least six years from the time a hybrid is first tested to the time it is commercially acceptable, and only a small percentage of varieties reach this point. "We test 200 to 250 hybrids a year, and we're happy if two or three become commercially viable," says King. In HeinzSeed's favor, plants grown from hybrid seeds are good for one generation only. Seeds saved from hybrid fruit will have wild segregation and tremendous variability. If a grower wants to grow the same tomatoes a second year, he cannot save the seeds from the tomatoes he



Bag material, and graphics on it, are a vast improvement over the prior paper/poly structure. The weigher has one scale controlling three heads, left, to meet the design speed requirements. After the bag is filled, a mechanism pulls it off of the pins and delivers it to the heat sealer, above.



Weigh/fill/bagging system, top left, has an accuracy of +/- 1 gram (300 seeds). As the bag leaves the heating section, it passes a rotary cutter, left, that removes the plastic material above the seal. To start each fill cycle, an air jet blows downward to open the top of the bag, above, after which a plunger descends to completely open the bag plus "pop out" the bottom gusset.

grew that year; he has to buy another batch of seeds for the second crop from HeinzSeed.

Bagger is master

The Weighpack system at HeinzSeed consists of an AEF-1 weigher mounted above and feeding a Zippy bagger. The system has an accuracy of +/- one gram (approximately 300 seeds) and a capacity of 40 bags per minute, although HeinzSeed is running it at about 20 bags per minute at present. The bagger is the master in this intermittent-motion operation. Each time a bag is opened beneath the feed chute, it signals the scale to drop product.

HeinzSeed puts 150,000 seeds weighing approximately one pound into each bag. Because seeds of different hybrids vary slightly in size and weight, bags vary in size. HeinzSeed is currently running four different bag sizes ranging from 6.5 inches wide by 9 inches tall to 7.5 inches wide by 10.5 inches tall. "Ease of changing from one bag size to another was one of the reasons we selected the Weighpack system," says King. "All we have to do is push a button on the operator panel."

Seeds are vacuum transferred to the weigher hopper by a Vac-U-Max pneumatic conveyor. A level switch in the hopper turns the transfer system on and off to maintain a constant level in the hopper so the scale heads are not overloaded or starved.

The weigher has one scale controlling three heads to meet the design speed requirements. Each head consists of two vibrating pans, a wider bulk

pan and a narrower dribble pan. At the beginning of the cycle, both pans vibrate to move the product into a weigh bucket. When about 95 percent of the weight of the product is in the bucket, the bulk pan stops vibrating and a door closes to ensure no more product will discharge from that pan. The dribble pan switches to a smaller vibration amplitude and continues to vibrate until the proper weight is in the bucket, at which point it stops and a door closes on that pan. One bucket discharges for each fill cycle while the other two buckets are filling.

Plunger helps open bag and gusset

Standup polyethylene terephthalate bags are supplied on wickets, and the operator places them on two pins extending out beneath the fill tube on the Zippy bagger. This can be done even when the machine is running.

To start each fill cycle, an air jet blows downward to open the top of the bag after which a plunger descends to completely open the bag plus "pop out" the bottom gusset. This piston opener is a special feature of the HeinzSeed machine. "The seeds are too light to push open the bag when they drop into it, so Weighpack developed this piston to open the bag before the seeds are filled," says King. The movement of the piston signals the weigher to discharge product from a weigh-bucket into the bag. Because product flows around the piston and into the bag as the piston rises, Weighpack had to do some work on piston design and speed of ascending



PLC-based control system can load 100 recipes, which can be run by merely entering the recipe number on the operator panel.

to ensure the piston didn't pull seeds out. "It wasn't a major problem because the seeds are so fine they flow like water, but we did make some minor changes to the piston so it wouldn't carry out any product," says Weighpack Territory Mgr. Charles Nadeau.

After the bag is filled, a mechanism with two fingers pulls it off of the pins and side-shifts to the left to deliver the bag to the heat sealer. Two parallel belts carry the bag past heating bars that seal the top. As the bag leaves the heating section, it passes a rotary cutter that removes the plastic material above the seal and blows it into a trash bin. The bagger can be equipped with an embosser or ink-jet coder at this point, but HeinzSeed did not include this option. Bags leaving the Zippy bagger drop into a container and are hand-packed for distribution.

Operator-friendly computer control

The weigher/bagger is controlled by Weighpack/Paxiom's Multi-Trix™ PLC-based control system, which is capable of loading 100 recipes, although HeinzSeed is using only four recipes at present (one for each bag size). For each recipe, the operator enters all of the necessary data and then assigns it a recipe number. To run that recipe, he then merely enters that number on the operator panel.

Each recipe includes all the information needed to control both the weigher and the bagger. For each bag size, this would include operating speed, fill weight, vibration times and amplitudes for both bulk and dribble pans, dump times and much more. The system also controls machine timing. For example, it will not open the discharge door on a scale bucket until it receives the signal that the piston bag opener has descended into the bag. It will not open the doors at the end of fill lanes until the discharge door on the scale bucket is closed, and it will not start pans vibrating until the doors at the end of the pans are open.

An automatic feedback system senses the weight in an empty scale bucket and automatically rezeros the scales so that they keep dispensing the proper weight. The operator sets the frequency of rezeroing, every 500 weighings, every 1,000 weighings or whatever he feels is appropriate, on the control panel. "This isn't a critical factor for us because the seeds are so clean and free-flowing, but there could conceivably be a dust buildup in a bucket, and this eliminates any possibility of that causing a weighing error," says King.

If the weigher runs out of product, it will shut itself off. To compensate for momentary shortages, the operator can set how long to continue running after the fill hopper is empty. As a fail-safe, a scale will not dump until it contains the proper weight of product.

History screens allow the operator to track the operation. Among other data, these show the average weight from each head, the number of bags run and the total weight of product dispensed in a selected period of time. Another screen allows the operator to observe the weight of each discharge as it occurs.

The Multi-Trix unit contains maintenance and self-diagnostic screens that help the operator determine the cause of problems that occur. A key element of the weigher/bagger is the use of quick-disconnect boards and other components that can be easily removed and replaced. If the diagnostic screen indicates a faulty component, Weighpack can send a replacement board overnight, and Heinz can easily plug it in.

"This application wasn't as easy it sounds. It initially presented a strong challenge to Weighpack/Paxiom, but they stuck with it and now it's doing an excellent job for us," says King.

Multilayer bags

The multilayer bags, which are supplied by C&H Packaging, are made with a 48-ga PET outer layer that is reverse flexo-printed and is adhesive-laminated to a 3.5-mil white opaque LLDPE inner layer that contacts the product. C&H makes the bags on a Totani machine sold by Amplas.

"Developing this bag was more difficult than it might appear," says Bob Madderom, sales & marketing manager at C&H. "The customer required very close tolerances. The wicketing and the gusseted bottom all contributed to the challenge. Our technical people worked closely with the Weighpack people to finalize this bag."

C&H was initially brought into the picture by Bob Lane of Socopac. "Bob suggested the film we should use for the bags, and it's worked out very well," says King. "It's a much better barrier than the paper/poly structure we were using before, and it's running well on the Weighpack machine."

More information is available:

Weigher/bagger: Weighpack/Paxiom, 514/422-0808.

Pneumatic conveyor: Vac-U-Max, 973/759-6449.

Bags: C&H Packaging, 715/536-5400.

Totani bag-maker: Amplas Inc., 920/496-0525.

Distributor for bags: Socopac, 949/859-3400.