Text: Helen Armstrong
Images: JD Propagation

Dan and Jenny Patience of JD Propagation. Their passion for producing quality plants is one of the driving forces behind the nursery's rapid growth.

Individual attention raises quality at JD Propagation

'Plants are not just a number, they are very personal'

JD Propagation, of Victoria, Australia, had planned to pay off its first four greenhouses in five years. In fact, the business has grown so fast that within six years it has paid off its 13th house. Attention to detail, including inspecting and handling each individual plant, so customers receive top quality plants sets the company apart.

Dan Patience is passionate about his plants. He admits he has been obsessed with plants since he was 15 years old, so it was natural that he should work in horticulture including for some of Australia's largest bedding plant and shrub nurseries. In 2009, Dan and his wife Jenny decided to start their own nursery.

They bought a paddock on the Mornington Peninsula, Victoria, a region rich in horticulture and home to some of their biggest customers. The climate is almost perfect, occasionally in winter it drops to minus 2-3 degrees and there is always a gentle sea breeze.

Natural gas

"We started with four greenhouses with money borrowed against their house. Luckily one customer placed orders before we even started!" His business plan was to pay off the first four houses in five years, but with a growing reputation this happened a lot faster. "We've grown in line with customer demand and just finished the 13th house in six years."

JD Propagation began growing herbs and bedding plants, such as calibrachoas, geraniums and verbenas from cuttings, and did some deflasking of tissue culture. Today it produces 3,000 product lines, about 5% of which are unrooted cuttings, 80% vegetative cuttings and rest are seed-produced plugs.

These are raised in ten double skinned poly growing houses, with energy screens and southwest facing window vents, that measure four metres to the gutter. This creates a good environment, says Dan Patience. The houses are heated using natural gas and the main heater in the growing house with lighting

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Plants move through ten growing compartments, each of which has its own growing environment.

also produces carbon dioxide. The nursery also has two mother stock houses and the latest addition was a nucleus greenhouse, all three of which are fully screened against insects.

Insect screening

"Our biggest weakness used to be the absence of insect screening so it was getting harder and harder to guarantee the virus integrity of our stock. We now have two insect screened mother plant houses totaling 1,200 m^2," he says. These were detached from each other but the latest house was built in between and attached to the two. This now accommodates nucleus material.

"We buy virus index material from international breeders overseas once or twice a year. We put this stock directly into the nucleus house and use it purely to take cuttings for the mother stock. Only two staff members are allowed to enter the house and they sterilize their tools after working on each plant."

Patience recalls that when he worked for the big wholesale nurseries, he often found the quality of plugs and cuttings wasn't all that great. "We first had to nurture and trim them before we could grow them on. When I started my own business my aim was to supply growers with a perfect plug that was ready to go immediately. We are so focused on quality that all our plants are visually inspected and handled by our growers. The fact that our plants are trimmed by hand, fed by hand and watered by hand sets us apart from other bigger plug producers in Australia. Plants are not just a number, they are very personal."

Constant improvement

Actually JD Propagation has very little automation, currently just a New Zealand designed climate control system called Autogrow, which is distributed by horticultural technology and innovation company, PowerPlants Australia. It has a touch screen design panel and can be logged into it from anywhere in the world. "We have also ordered an Ellepot machine for the production of paper pots for cuttings so we'll be installing that later this year.

"We used to make up our own potting mixtures, by sourcing our own peat and blending it with perlite to get it right. Three years ago we ran some trials with Pindstrup substrates as I had used these at a big nursery in the past. The results were so good we switched to using entirely their products and now we import three to four containers per year. We use four mixes: small cell; two general ones; and a mother stock recipe. The mixes are always the same, the quality is excellent and the cutting are really vigorous so it makes life really easy."

The nursery also recently introduced a new form of bench heating. "Originally we used heated mats on the benches but because the pots were sitting on the mats sanitation was a problem. It was difficult to disinfect properly because of the many pockets in the matting that harbored debris. "The top of the bench is now made from plastic mesh with PVC heating pipes running directly underneath. Water can drain away and we can sanitize really easily. Also, each greenhouse has a concrete floor so it is super clean."

Hardened off in customer climate

Patience's main aim is to produce a quality plug that is hardened off and finished properly. Each growing compartment is 512 m^2, which consists of two houses of 256 m^2; once the cuttings are struck they move through each compartment. Finally they are hardened off in the exact environment as that of the customer. "If they grow outdoors we finish our plants outdoors, if they produce under cold plastic, we finish the plants under cold

Strict hygiene measures are employed in the nucleus greenhouse and mother stock houses.

Plants are hardened off in the exact environment as that of the customer.

Young plants have plenty of vigor so grow on immediately when they arrive at the customer.

The tops of the benches are made from plastic mesh with PVC heating pipes running directly underneath, making them easy to clean.

plastic. By the time the cutting reaches the customer it will have spent 25% of its life matching the customer's environment so the plants don't experience any shock when they arrive." On average the crops are 6-8 weeks old when sold.

Light recipes

The nursery is also using several LED lamp recipes. Traditionally it used HID lighting for crops that were running behind or if plants were needed very fast. Now the interruption of day/night is done with LEDs.

"We use a few spectrums of red, a few spectrums of blue, white light, a little far red and some infrared all of which we blend together. We can produce plants very fast with the lights on at night and the heater running to produce CO_2.

"By using the correct spectrum we can achieve the results we want with low energy input. Energy costs are rising so anything we can do to save on these costs is important. If we can keep our energy costs down and speed up our cropping time we can achieve more plants per square meter."

Experimental

The company ships across Australia to around 80 customers. Having grown nearly 30% every year for several years it is now in a consolidation phase. "We have grown so fast we don't want to outstrip the skills of our staff and we need to ensure that we keep on top of our quality. We are now focusing on growing skills and making sure everyone really understands what they are doing before we expand any further," he says. The company employs 25 people including five experienced growers.

Nevertheless, Patience is further experimenting with plug grown camellias and producing them in 24 cc volume plugs. "This is not traditional but because of our liquid feeding regime we can get them to the grower with a lot of vigor. When the grower pots them on they have a better growth rate than those produced in a larger pot or tube. "We work hard on getting the protocols in place and mastering any new cultivation that a customer requests. We enjoy a challenge"

Summary

Australian company, JD Propagation, checks every plug tray and plant by hand to ensure quality is maximised. The cultivation strategy, including attention to substrate, hygiene and LED light recipes, helps create optimum growing conditions for the production of vigorous plants. Each crop is hardened off in the same conditions it will experience at the grower.

Still a lot to learn about NGG

Next Generation Growing and control over the climate by means of air conditioning receives lots of attention. And rightly so, because the possibilities are huge. Over the last few years we've learned to grow using much less energy and, independently of the energy savings, this has also led to better results and fewer problems from Botrytis.
Still, I think that much more is possible. Together with Climatune we set up a small trial greenhouse in which the air is warmed and cooled by means of an air conditioning unit. By keeping the windows closed and working with a slight over pressure, the climate in the greenhouse is very uniform. And that is without all the hassle of hoses under the gutters.

When the developer of this system, together with a technology fund for horticulture, knocked on the door with this story, I didn't believe it was possible. That would mean that everything that has been devised so far regarding closed greenhouse systems is far too complicated. So, just like we often do, I said, 'Let's give it a go'. Therefore with support from the technology funds we set up the trial and started to grow with surprising results. The idea behind the system is to work with air conditioning and over pressure for as long as conditions permit. In practice, this means that the greenhouse remains closed until the outside temperature is above 20°C. Then during the day we ventilate as usual.

What has surprised me the most is that we keep the crop well balanced without any pipe heating. The biggest advantage of the system is especially during the artificial lighting season between early September and mid-April. Because you can circulate the greenhouse air under the screen, without opening the windows, the climate is much better despite the fact that the screen remains closed. The CO_2-level is also much better to manage. So far, we are very enthusiastic.

However, it is a small trial in an old greenhouse. Therefore we want to set up a larger trial of approximately 3000 m² in a new greenhouse. We think that it is better to bring in part of the heat via the pipe heating and then control the last bit with air treatment. Otherwise a lot of unnecessary air conditioning units are needed while ultimately it's about achieving an over pressure. There is still a lot to learn, but at least we now know in which direction we should be going.

Frank van Kleef,
Tomato grower and member of Harvest House