Benefits of bamboo

Dell's breakthrough bamboo packaging was borne out of a new strategy aligned with global environmental goals. Joanne Hunter spoke to **Oliver Campbell**, Dell's director for packaging, who championed the project.

Oliver Campbell
Oliver Campbell is the director of procurement for packaging and packaging engineering at Dell. He leads teams in the US, Europe and Asia for all Dell products and has focused on the supply chain with leadership roles in strategy, procurement and logistics.

Consumer electronics group Dell completely overhauled its packaging strategy in 2008 with the aim of bringing the huge US corporation in line with global goals for carbon reduction and better use of natural resources. Dell's framework packaging strategy, tagged the 'Three Cs' (cube, content and curb), addressed the size of a package, the type of material being used and its suitability for recycling.

This approach encouraged innovative thinking and sparked a breakthrough: the development of protective transit packaging made of native Chinese bamboo for products that Dell manufactures in China. With enthusiastic project leadership, the right contacts in China and impatience to commercialise, but not to compromise on quality or environmental protection, the strategy propelled bamboo packaging into use by Christmas 2009. Since then, and because of the social, economic and ecological benefits in its wake, the bamboo project has received awards and nominations from China to the UK.

> "Dell's new packaging made with the longer, stronger fibre is 100% bamboo with no other material mixed into it."

Going bamboo

For the huge volumes of expensive consumer electronics being moved around the world, resilient transit packaging is a priority. Dell's new packaging made with the longer, stronger fibre is 100% bamboo with no other material mixed into it.

The success of bamboo packaging, tailored for China, is a personal highlight for the project's leader Oliver Campbell, director for Dell Packaging, and draws on his background in sustainable agricultural resources. He brought in paper and packaging specialist Unisource Global Solutions (UGS) to help reduce the impact of protective packaging for products that originate in China and are shipped to the US. The firm established that bamboo was plentiful in commercial quantities and has all the properties required for an end-to-end sustainable supply chain. UGS already had access to sustainably grown FSC-certified bamboo in China.

The speed to production is impressive. In June 2009 Dell investigated the fibre characteristics and engaged in prototyping throughout the summer. The team cranked up a gear when it was told that the January 2010 launch had been brought forward to November 2009, to meet Christmas demand for the Dell Mini10 and Mini 10v netbooks.

This 'local' solution for China is only the beginning for Dell, which hopes to develop similarly novel packaging materials specifically for manufacturing locations elsewhere in the world. In doing so, Dell is showing that it is possible to solve a dilemma facing all manufacturers in the now bedded-in culture of sustainability: how to grow production; achieve consistently lower costs to produce goods; and behave responsibly towards people and the environment – all of these, without compromise.

For something as necessary as packaging, Dell's answer is to use local, abundant and commercially available resources. Bamboo is an ideal crop because it grows quickly. A member of the grass family, it is among the fastest growing woody plants in the world – up to nearly 61cm (24in) per day – reaching full harvesting maturity within three to seven years.

The plant is strong: according to Dell, bamboo's tensile strength is comparable to that of steel, making it a reliable material for protecting technology equipment in transit. Bamboo can also help promote healthy soil: a deep root system protects against land erosion, and it should not require replanting after harvest.

The success of bamboo has put wind under Dell's wings to look at other indigenous materials suitable for mechanical pulping to produce formed packaging. An example is bagasse – the remains of processed sugar cane – already being used to make disposable food containers. Other suitable contenders

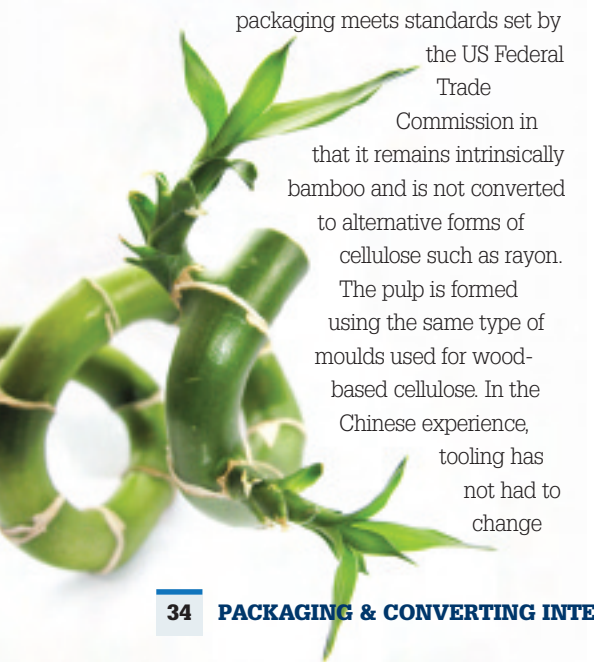
are rice hulls and seed husk from commercially grown local crops.

In packaging terms, it is important for Dell to think of all the outcomes throughout the supply chain, from origination of source raw materials to end of life. Tests validate that no hazardous chemicals exist and they show compliance with American Society for Testing and Materials D-6400 certification, for compostability. To meet US Federal Trade Commission recycling guidelines, Dell directed an initial survey of community infrastructures for post-consumer packaging materials. Of 60 municipalities, 20% stated it was possible to handle bamboo, 60% had no idea whether it was possible and 20% said it was not possible. The result was not unexpected and was comparable with other materials introduced in the past. To introduce a novel material and convince others of its benign effect on existing waste stream "is an education process", says a patient and pragmatic Campbell.

He confirms that test results from paper converter Georgia Pacific show that bamboo can be blended into the old corrugated cardboard stream without detriment to the outcome. It could produce an even stronger recycled product because bamboo has a characteristically long fibre.

"We don't believe it will interfere with recycled paper processes, or with existing machinery at the front end for producing the formed packaging," Campbell adds.

Dell is directing a second municipal survey and education process through UGS that will be completed in the first half of 2011. Campbell explains that bamboo packaging meets standards set by the US Federal Trade Commission in that it remains intrinsically bamboo and is not converted to alternative forms of cellulose such as rayon. The pulp is formed using the same type of moulds used for wood-based cellulose. In the Chinese experience, tooling has not had to change and bamboo runs through the same machinery.



For obvious business reasons, this application of bamboo packaging was part of an initial exclusive agreement between Dell and Unisource Global Solutions. "But we felt it was in our customers', our own and the planet's interest to promote it," says Campbell. "The aim is to not be permanently exclusive. Companies outside our industry have contacted us about bamboo and we have shared our experiences with them."

He adds that while the full range of end-of-life possibilities has still to be fully examined, Dell can confirm that bamboo is suitable in aerobic and anaerobic composting processes; for example, industrial anaerobic composting has begun to occur in the UK.

Growth of FSC bamboo

Unisource Global Solutions in China has expanded its FSC bamboo forest from 8,000ha to 30,000ha. Dell explains that the way the bamboo plant regenerates is different to that of soft and hard woods. It self propagates and can be harvested after three to five years. This reduces the land devoted to forests and there is no adverse clear cutting to affect the level of biodiversity.

Campbell says that non-governmental bodies are very supportive. "The only downside is that bamboo is not grown globally," he says. "Other solutions must be found that allow working with sustainable agricultural materials."

The prospects for bamboo are getting ever better. "Since the bamboo packaging has been in production, process yields have gone up substantially to become increasingly cost-effective," Campbell points out.

"The challenges that met Dell at the outset included winning control of production processes, by way of using the right pressures and temperatures. These improved process control practices are being applied on our dedicated lines for bamboo."

As for the future of bamboo: "Its usage is growing, led by Dell Notebooks, and the company is looking to using more bamboo where it is feasible to do so."

Dell's Three Cs

Dell's Three Cs plan to simplify and revolutionise computer packaging is hoping to save more than $8 million and avoid around 10,000t of packaging materials from a 2008 baseline to 2012.

"We have already made great progress toward our commitment," says Campbell. "We've reduced packaging volume by over 13%, surpassing the original goal of a 10% reduction. So far, we have increased the amount of recycled content in packaging by approximately 33% (close to the 40% goal). We have increased the amount of materials in packaging to be kerbside recyclable to 57%."

Dell won the 2010 CHaINA Award for Greenest Supply Chain in Asia. The sponsor is The Global Supply Chain Council.

"Our bamboo packaging won for its positive environmental impact on the both the front end and back end of the supply chain," says Campbell. "Our entry covered the supply chain from the FSC-certified forest, through the mechanical pulping operation, using recycled water; to moulding and using natural sun drying on sunny days to the customer and the ability to compost the bamboo packaging."

In addition, Dell's bamboo packaging was nominated as one of four semi-finalists, and the only US company, in the 2010 Global Green Awards for Creativity in Sustainability in the category of Best Green Packaging. Among the most prestigious in the industry, the awards were announced in London in November 2010, in the presence of HRH Prince Charles.

"The venue for the awards was the dinosaur hall at the British Natural History Museum – it served as a sublime reminder that if we don't help the environment the same fate may befall us as the dinosaurs," says Campbell. "Developing packaging that is lightweight, strong enough to protect our products in transit, avoids the need to cut down hardwood trees and can return to the ground to sustain new plant growth – those are the kinds of long-term, sustainable solutions we want to provide for our customers.

"We're exploring the frontier of sustainable packaging here, and we're actively working to integrate more innovative, agricultural materials into our packaging portfolio." ■