DECEMBER 8, 2009

Hold the foam - greener packing on the way?

In the holiday spirit of sharing, here's a guest post from Frank Roylance, the Baltimore Sun's weather and science maven:

'Tis the season for grappling with those big white blocks of featherweight polystyrene that kept your new computer or flat-screen TV safe from harm on Santa's sleigh. Huge volumes of the ubiquitous packing material will get stuffed into trash bags and garbage cans en route to their eternal rest in landfills where, by one government estimate, they take up one-third of the total volume of buried waste. All that plastic foam comes from petroleum, and it never really goes away.

But a pair of young entrepreneurs from Vermont say they've invented a "green" alternative (pictured at right)made from agricultural waste and mushrooms. After their product has done its job, they say, you could put it in your garden and watch it break down and enrich the soil.

Eben Bayer and Gavin McIntyre are the founders of EcovativeDesign, a New York company that manufactures a hard foam-like packaging material they call EcoCradle, which they say could eventually replace polystyrene - the generic name for foam packing material commonly (but mistakenly) called Styrofoam - which is actually a proprietary Dow Chemical Co. insulating product.

Polystyrene, Bayer said, is "a high-energy product used for a few weeks, then you throw it in the landfill." There, "it stays pretty much indefinitely. The stuff never goes away. It gets smaller, and finds its way into plants and animals, even into our own bloodstream."

As an undergraduate at the Rensselaer Polytechnic Institute in upstate New York, Bayer, now 24, was assigned a project: Find a green alternative to polystyrene. He began thinking about fungi, like mushrooms, which live in the soil and help to break down organic material even as their roots help to bind the soil together. Bayer (at left in picture) and McIntyre (at right) eventually focused on a mushroom called mycelium, and began experimenting.

"Mushroom roots are the glue that holds the soil together," Bayer said. "We took that concept and spent the last three years … and adopted that into a process which used the same phenomenon to transform agricultural waste into a white material that looks and feels a lot like polystyrene but requires 10 times less energy" to manufacture. The agricultural waste consists of cotton seed and buckwheat seed husks. They grind it up and mix it into a slurry with water and mycelium root cells they have isolated and cloned for use in their manufacturing process. Poured into a form, the liquid suspension is held in the dark, at room temperature, for five days.

"There are no big, expensive presses," Bayer said. The mushroom root cells simply begin to grow, and soon entangle the seed husks and hold it all together in the prescribed shape. The final product emerges damp, so it's dried in a low temperature oven. It is white, with the ag waste still visible in the material. ("A distinctive appearance that speaks to its roots," the company's Web site says.) It is a bit denser than polystyrene, "but typically we ship items that require higher density, like tables," he said.

The cost? “We can be price competitive with polystyrene today,” Bayer said. “We’re usually within 10 percent of costs with the customers we’ve worked with so far.”

Like wood, the Eco-Cradle holds up indefinitely, Bayer said. But when exposed to water and microbes, it breaks down. When it comes time to get rid of the stuff, customers can do what they do now. “The beauty of it is, if you do just as you’ve always done” and send it to the landfill, “you’re actually sending something valuable for the environment.” Even in an oxygen-poor environment deep in the landfill, the Eco-Cradle will still decompose. But “we’d prefer people put it in their compost or garden,” Bayer said.

The young company has plenty of ambition. “We have four development projects close to shipping,” he said. Customers include a Fortune 500 company and several companies in upstate New York. Ecovative Design also plans to commercialize its Greensulate product, a rigid board used for building insulation in place of a Dow Styrofoam product. The company employs just nine people, working from a 10,000-square-foot plant in Green Island, N.Y. that gets its electric power from a hydroelectric station.

Bayer and McIntyre hope to have another manufacturing facility running in the Midwest in 2011, “where our current customer base is, and also a source of great agricultural material. In the long term we want to do this globally.” For more: http://www.ecovativedesign.com/

(Photos by permission EcovativeDesign)