

# What does this woman have to do with seed?

She's wearing **corn!**

PHOTO COURTESY DUPONT

From fabric to detergent, this new corn product is meeting industrial needs for bio-based products.

By Angela Dansby

**S**ORONA IS A POLYMER that is on its way to becoming 40% bio-based (by weight), thanks to corn, and appearing in everything from textiles to detergents. The ingredient, called Bio-PDO, will be incorporated into Sorona in early 2007, displacing petroleum-based propanediol and offering both performance and reduced environmental impact.

On November 27, DuPont Tate & Lyle Bio Products, LLC, a joint venture of DuPont and Tate & Lyle, announced the first commercial shipments of Bio-PDO (1,3 propanediol) from its \$100 million U.S. facility. It uses corn sugar instead of petroleum-based feedstocks to create Bio-PDO, allowing for a more energy efficient manufacturing process and less greenhouse gases, according to Peter Hemken, Vice-President and General Manager of DuPont Bio-based Materials. Production of Bio-PDO versus petrochemical-based PDO consumes 40% less energy and reduces emissions by 20%.

Glucose, derived from commodity corn kernels, comes from Tate & Lyle's wet mill, which is sent to the Bio-PDO processing plant. A proprietary fermenting process turns the sugar into a monomer, which is then shipped to a polymer plant to create Sorona polymer strands. The latter are cut into pellets for textile plants to spin them into fibers, which are ultimately used for carpet and apparel.

Mohawk Industries is DuPont's exclusive partner in residential carpets. Its SmartStrand brand is made with Sorona and sold via thousands of retailers, including Home Depot, according to Jenny Cross, Brand Manager for Mohawk Residential. SmartStrand offers durability, permanent stain resistance, softness, resiliency and easy care. It will perform as well, if not better, with Bio-PDO, says Hemken. The renewable aspect will be promoted when it is incorporated into SmartStrand in the fall of 2007.

Fabric gets the same benefits from Sorona along with UV and chlorine resistance. Consumers enjoy a "comfort stretch"

in apparel made from the fabric due to a kink in the polymer, says Hemken. Fabric made with Sorona is not branded at the consumer level, but DuPont is launching it to appeal to environmentally-conscious consumers.

Bio-PDO can also be used in auto interiors (upholstery and carpets), cosmetic products like shampoos and hand creams, liquid detergents, antifreeze and thermoplastic resins for molded parts in automobiles as well as packaging materials. Bio-PDO is easier for manufacturers to work with than PDO in some of these products, Hemken notes.

"PDO historically was not widely available because it's expensive to manufacture from petroleum," he says. "Bio-PDO, however, is more economical to make, which has opened up opportunities in other industries. The value of some grades is \$1 to \$2 a pound in some areas like cosmetics and personal care."

Two new brand names for Bio-PDO were recently announced: Zemea for personal care products and liquid detergent, offering purity and low irritation, and Susterra for de-icing fluids, antifreeze and heat transfer fluids with low toxicity and biodegradability.

Hytrel, a flexible polymer used in engineering resins and molded parts, is next on DuPont's list for becoming partially renewably resourced, Hemken says. With a renewable ingredient, it will be 30 to 70% renewable and available at the end of 2007. Sorona and Hytrel, however, are the "tip of iceberg with renewable resources."

"We're shifting the growth direction of our company to more opportunities that combine biology and chemistry," he notes. "We're using the power of integrated science to capture growth opportunities in many areas."

By 2015, DuPont plans to grow its annual revenues by at least \$2 billion from products that create energy efficiency and/or significant greenhouse gas emissions reductions and nearly double its revenues from non-depletable resources to at least \$8 billion. **SW**