

## **Biodegradables Take Off**

European Plastics News' **3rd Biodegradable Plastics Conference** (26-27 November 2001) took place at a time of major investment and renewed interest in the field. *Andrew Warmington reports*

Europe is set to be the most promising region for biodegradable plastics in the coming years. First full field trials in Kassel, Germany, are producing promising early results and huge new capacities are going up.

Consumption in the key target market of food packaging appears to be taking off, but the use of genetically modified organisms (GMO's) in raw material crops remains a huge stumbling block. These were among the key conclusions of EPN's latest conference on the subject in Frankfurt in November.

In 2000, European consumption of biodegradable plastics amounted to 10,000 tonnes – 40% of the world total, said Greg Bohlmann of SRI Consulting.

As environmental pressures grow and new capacities achieve economics of scale, this could reach 60,000 tonnes/year in five years, with four areas each amounting to over 10,000: food packaging, compost bags, paper coatings and dishes and cutlery. Loosefill packaging and agricultural films – which Bohlmann regarded as the only markets likely to attain that figure in the US and Japan respectively – are likely to remain minor applications in Europe, as will hygiene disposables. Europe is the strongest potential market because it is driven so much by regulation, whereas price/performance issues dominate in the US and, to a lesser extent, Japan.

Cargill Dow's Marcel Dartée agreed that Europe would probably account for half of its market and would naturally be the most probable location for a second plant in about 2004. The company has just brought on stream its 140,000 tonnes/year polylactic acid (PLA) plant in the US, by far the world's largest.

Much of this is for fibre applications, but the company has already worked with a number of leading European packaging converters – including Trespaphan on oriented PLA films, Klöckner Pentaplast on thermoformed trays and lids and Autobar on thermoformed dairy pots.

Food retailers are also increasingly interested. Novamont has begun supplying knitted and extruded nets for fruit to Tesco, the UK's second largest supermarket, among others, and biodegradable bags to Swiss and German supermarkets. In the Netherlands, the top retailer, Albert Heijn, uses certain biodegradable packages from Natura Verpackung.

For Sainsbury's, the use of biodegradable plastic packaging is written into its current environmental report as a way in which it is "building on its leadership of the organic food market".

The company now has composting trials ongoing from food waste at 75 of its stores, using Mater-Bi biodegradable bags. It has also been packaging a growing number of its organic fruit

and vegetable products in starch-based materials processed by Apack and coated with Eastman Chemical's Eastar Bio aliphatic-aromatic copolymers.

However, Sainsbury's packaging innovations manager Terry Robins also had to point out some limitations. "I would love to be able to use PLA, it is a great material, but we can't at the moment because we would instantly face media scare stories about it coming from genetically modified crops" he said.

"Even though the GM signal is removed at the fermentation stage, the fact that it comes from GM corn creates huge problems of consumer perception. Unless the supplier can guarantee that there is no material of GM origin – which I accept is impossible – this problem is insuperable".

As well as Cargill Dow, capacities are going up in Europe: 40,000 tonnes/year from Rodenburg Biopolymers for its starch-based Solanyl materials in the Netherlands, about 30,000 from BASF in Germany and a new 8,000 tonnes/year line from Novamont. Finding markets for all of the new capacities will be a major challenge.

The conference also saw the emergence or re-emergence of a number of technologies that will not depend on plant capacities, notably from ECM BioFilms of the US. The company says that its masterbatch additive technology are already proven to degrade all kinds of conventional PE and PP to CO<sub>2</sub> and water, at loadings of 1% or less.

Company director Robert Sinclair also claimed that the technology appeared to work with PVC and polystyrene, though further testing is needed. The process will be marketed actively in Europe in a short time.

"The technology adds only about 4-6% to the cost of the raw materials, overcoming the biggest barrier to the development of biodegradables" Sinclair said. However, few technical details are available due to patent considerations in the US and others doubted whether the technology would meet European compostability standards.

Metabolix, which makes polyhydroxy alkanates (PHAs) by fermentation of corn, is currently evaluating switchgrass, a mid-West Prairie grass, as a raw material. "We believe that within five years we will be able to produce the polymers at costs that match those of PE and PP now," claimed director of applications development, Robert Whitehouse.

Meanwhile, Procter & Gamble – one of the world's largest suppliers of consumer goods – has developed its own PHA material called Nodax. Company project manager Nora McDonald explained that no material on the market met the requirements for its nappy backsheets, but Nodax will also be licensed out to third parties.

*This report is reprinted from the January 2002 edition of European Plastics News. Copies of the full documentation are now on sale, price £250 including postage and packing. For details on ordering these, please e-mail: [conferences@ebc.emap.com](mailto:conferences@ebc.emap.com). Or telephone the conference team in the UK: +44 (0)20 7505 8564.*