

R. David Whitby

# Developments with bio-lubricants

How the USDA's BioPreferred program is promoting the use and manufacturing of bio-based products.

**IN THIS COLUMN** we've discussed bio-lubricants and reported about their developments and fluids in Europe. Today we look at several exciting new developments with these oils.

For example, in North America, the U.S. Department of Agriculture's BioPreferred® program, defined in the U.S. Farm Bill of 2002, was initiated to promote the increased purchase and use of biobased products, aiming to spur economic development by providing new markets for farm commodities.

According to the USDA, the use of bio-based products will (1.) reduce U.S. reliance on petroleum, (2.) increase the use of renewable agriculture resources and (3.) potentially contribute to reducing adverse environmental and health impacts.

The USDA BioPreferred® program has two major initiatives:

- **Product Labelling.** The USDA certifies and awards labels to qualifying products to increase consumer recognition of biobased products.
- **Federal Procurement Preference.** The USDA designates categories of biobased products that are afforded preference by federal agencies when making purchasing decisions.

The USDA designates categories of bio-based products for a Federal Procurement Preference. In the process, minimum bio-based content standards are established for each product category. There are 97 BioPreferred® designated product categories required for preferred federal purchasing. These include greases, metalworking fluids, chain lubricants, gear lubricants, forming lu-

bricants, slideway lubricants and water turbine bearing oils. The European Union (EU) is now considering whether to adopt a similar program.

Emeryville, Calif.-based, Novvi is developing base oils designed to improve upon key environmental metrics, including biodegradability, toxicity and renewability when compared with petroleum-sourced base oils, while delivering performance characteristics comparable to Group III and Group IV base oils. Amyris Brazil, a Novvi subsidiary based in Campinas, uses its industrial synthetic biology platform to convert plant sugars into a variety of hydrocarbon molecules. Amyris is commercializing these products as No Compromise® renewable ingredients in cosmetics, flavors and fragrances, polymers, lubricants and consumer products.

Matrica, a joint venture between Polimeri Europa (Eni) and Novamont, which was established in June 2011, aims to design, build and manage chemical plants that use vegetable oil feedstocks for the production of bio-plastics, bio-lubricants and bio-additives for elastomers. With a total investment of €500 million, the project consists of seven new plants, an integrated production chain from vegetable oil to bio-plastics and bio-lubricants, to be completed by 2017, and a research center devoted to bio-chemistry that started work later in 2011.

In September 2013, Woodridge, Ill.-based, Elevance Renewable Sciences announced the commercial availability of Inherent™ C<sub>18</sub> Diacid, a mid-chain length, biobased diacid that the company claims will enable producers of polyamides and polyurethanes, lubricants and adhesives to significantly expand their portfolios with cost-competitive products



that demonstrate performance not possible from products made with more common, shorter-chain diacids.

Elevance's process to produce C<sub>18</sub> Diacid (octadecanedioic acid, ODDA) uses materials produced from its world-scale (180,000 tonnes per year capacity) biorefinery in Gresik, Indonesia. According to Elevance, its proprietary metathesis process allows it to make ODDA with the purity required for demanding applications at a cost that is competitive with other specialty diacids in the marketplace.

In October 2013, Elevance announced the construction of its second world-scale biorefinery in Natchez, Mich. The decision to build a second plant was based on the successful startup of the plant in Indonesia in addition to "robust customer activity and demand forecasts for the company's speciality and intermediate chemicals." The second biorefinery is scheduled for completion in 2016.

In addition, Elevance announced that with commercial production underway at Gresik, customer activity continues to increase in each of the company's market platforms. The Gresik plant currently uses palm oil as its primary feedstock, while the Natchez plant plans to use canola or soybean oil. Both plants are capable of operating on multiple renewable oil feedstocks, including jatropha or algal oils, when they become commercially available.



David Whitby is chief executive of Pathmaster Marketing Ltd. in Surrey, England. You can contact him at [pathmaster.marketing@yahoo.co.uk](mailto:pathmaster.marketing@yahoo.co.uk).