

Bioproducts 2.0:

Why Canada's soybean industry is partnering with the world's largest lab-for-hire

By Lisa McLean for Soy 20/20

Most soybean growers have heard the stories about Henry Ford's enthusiasm for soybeans.

Ford famously championed soy – along with wheat, flax and other crops – in the development of auto parts, including plastics and paints.

But those products were not without their drawbacks: automotive paint enamels and coatings, for example, offered poor durability, limited colour options, and took several days to set.

Rick Heggs, senior marketing manager with Battelle, the world's largest non-profit research and development organization, counts Ford's early forays into bio-product development as part of an era he calls "version 1.0" – when it was still fairly routine for industry to develop agricultural products for industrial uses.

Heggs spoke about oil and fatty acid industrial products at the 25th Canadian Conference on Fats and Oilseeds held in Quebec City October 5-6.

"Everything prior to 1860 was based on bioproducts," Heggs said. "Then the age of petrochemicals began, and bioproducts lost their lustre. We started switching from natural products to synthetic products."

According to Heggs, the petrochemical revolution brought some unexpected benefits for bio-products too: scientists developed a stronger knowledge of synthetic organic chemistry.

"Now, in bio-products 'version 2.0' we're applying those tools and techniques to natural products to modify them for industrial use," Heggs said. "Many times we are replacing the functionality of a petrochemical but we're not providing the exact same molecule. We look for functionality rather than identical substitution."

Heggs said today, only about two per cent of industrial chemicals are derived from renewables, with the remaining 98 per cent derived from fossil fuels such as coal, natural gas or oil.

He sees big opportunities for chemicals from renewables, predicting a fivefold increase in that market share by 2020, and as much as a 50 per cent increase by 2050.

Growing demand for high oleic soybeans

As the world's largest lab-for-hire, Battelle has a mandate to bring business and scientific interests together for positive change. This includes working with Soy 20/20, an industry

organization with a goal to encourage and expand new market opportunities for Canadian soybeans.

“New high oleic soybean varieties significantly improve performance of soybean oil and will play an important role in opening new market applications for Canadian growers,” said Rob Roe, bio-product commercialization director with Soy 20/20. “We’re seeing a lot of interest from industry in these varieties for food processing and industrial applications.”

Heggs said that with a variety of feedstocks and a good understanding of the differences in the fatty acid profiles of different oils, scientists are able to take oils as a feedstock and transition them to desired industrial products.

“There’s a tremendous variety that we now have for taking these natural oils and products and converting them into industrially useful products,” said Heggs.

No “green premium” here

Heggs said Battelle recognizes there are sensitivities around using crops that are grown for food, and the company works within the confines of the food industry’s requirements.

He said commodity soybean oil is quite different from oil produced by selected breeding, and echoed a strong interest in genetically modified (GM) soybeans and the focus on oleic oils.

“Obviously it has to be cost-competitive and it has to be available,” Heggs said. “Study after study has shown there is little to no green premium in the marketplace. So we have to be competitive both on performance and cost to be successful.”

Soy 20/20 has a long-standing relationship with Battelle, using the company’s experts to help evaluate new market opportunities. This is particularly relevant to bioproducts made with high oleic soybean oil, but also for the potential that the new high linoleic soybean variety from the University of Guelph might offer as well, says Roe.

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