

Squeezing more from the seed

Scientists hope to keep Canada competitive with higher yield seeds

By Jason Hagerman

Canola oil is a Canadian agri-invention that contributes billions of dollars to the national economy. Phytola, a research centre at the University of Alberta, plans to increase the oil content of canola, increasing the economic value of the multi-billion dollar crop to canola farmers in Canada and, eventually, across the world.

“In 2009, the last year of full statistics available, canola farm gate sales were over a billion dollars,” says Dr. Stan Blade, CEO of Alberta Innovates Bio Solutions. “That’s money directly into the pockets of Alberta farmers.”

However, canola is grown in an increasing number of countries and Canada’s monopoly on the crop is likely to diminish.

“Other parts of the world are trying to mimic the traits of canola in other oilseeds, so our research teams need to continue with cutting edge research on the crop that’s so important to us,” says Blade.

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Phytola plans to increase the seed oil content while developing a suite of next-generation oilseed development tools and technologies. The research centre plans to achieve this goal with its share of a \$4.5 million investment from Alberta Innovates Bio Solutions, split between Phytola and Livestock Genetic, a research centre focused on similar yield increases in livestock.

Led by Dr. Randall Weselake, a Canada Research Chair in Agricultural Lipid Biotechnology, Phytola is attempting to meet an oil content target of 45 per cent by 2015, a goal established by the Canola Council of Canada.

Currently, canola seeds are about 43 per cent oil.

“Canola is the leading cash crop on Canadian farms and every one per cent increase in seed oil content adds approximately \$90 million to the value of the canola industry,” says Weselake.

In 2008, canola added \$14.1 billion in economic activity to the Canadian economy. In addition, Canola exports account for about 75 per cent of annual production in Canada, resulting in \$2.8 billion for the domestic economy.

“People are moving away from the trans fat approach to life,” says Blade. “A number of companies are using canolas with spe-



cific fatty acid compositions that were developed through programs similar to that at Phytola.”

Aggressive yield targets

In 2007, the Canola Council of Canada set aggressive targets for canola production, calling for a 65 per cent boost in production from only three years ago, to 15 million tonnes, by 2015. Canada produced 9.1 million tonnes of the rapeseed variant in 2006, down from a record 9.7 million tonnes the previous year. The industry also plans to boost canola seed exports, according to the Canola Council of Canada, to 7.5 million tonnes by 2015.

According to Statistics Canada, the 2010 Alberta canola harvest was the largest on record, rising 16 per cent from the previous year and bringing provincial stocks to 2.7 million tonnes. Although other provinces reported weaker harvests—Saskatchewan was down by 36 per cent—the industry is still on track, says Blade.

Based on the high throughput screening technology developed by Weselake that forms the backbone of Phytola’s research, the research centre also plans to modify flax to address the critical shortage in aquafeed.

“Aquaculture is currently the world’s fastest growing food production sector, but relies heavily on fish oils to achieve the desired nutritional composition in farmed fish,” says Weselake.

Flax oil is already rich in the precursors to the long-chain omega-3 fatty acids which are desirable in fish oil, and is a natural choice for the production of aquafeed.

It may take several years to fully integrate breakthroughs at Phytola into the market, but the research centre hopes to attract more industry partners to accelerate potentially lucrative breakthroughs. **BB**