

# SOY 20/20 PROJECT ANNUAL REPORT

JUNE 2003

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## SECTION 1: SOY 20/20 Project Annual Report

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# SOY 20/20 PROJECT

JUNE 2002 – JUNE 2003

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## **Soy 20/20 is funded by the following partners:**

*Agriculture and Agri-Food Canada*

[www.agr.gc.ca](http://www.agr.gc.ca)

*Ontario Ministry of Agriculture and Food*

[www.gov.on.ca/omaf](http://www.gov.on.ca/omaf)

*University of Guelph*

[www.uoguelph.ca](http://www.uoguelph.ca)

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[www.soybean.on.ca](http://www.soybean.on.ca)

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**Section 1**

**JUNE 2003**

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**ANNUAL REPORT**  
*June 2002 – June 2003*

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**1. Creating an Innovation Climate (Market Analysis)**

We started our activities within Soy 20/20 by completing a thorough market analysis of the existing Canadian soybean market and the potential for future opportunities. Future opportunities were assessed on both economic (cost point analysis, and potential incremental value per sector) and technical levels. This document will only attempt to summarize the key findings. The complete market analysis document is enclosed as Section II of this report.

The existing Canadian soybean market is relatively mature, with existing market opportunities, crushing capability, and food grade exports creating a demand roughly equivalent to average supply. Under normal circumstances this would mean that an increase in demand would result in an increase in price, however, the presence of an overabundance of supply from the U.S. creates an artificial buffer on this dynamic. An increase in demand for Canadian soybeans will increase prices, but this increase will be limited to the difference in cost between sourcing soybeans locally versus the cost of shipping them in from the U.S. This means that for Canadian soybean producers to gain value from increased demand, the increased demand must come from Canadian sources.

We estimate that a new market opportunity representing a minimum of 50,000 acres of demand will have the potential to have a positive effect on Canadian soybean prices. We refer readers of this annual report to our Market Analysis document (attached) for a full description of our assessment of opportunities for Canadian soybeans, and a description of what we envision as necessary activities to transform these opportunities into realities.

## **2. Enhancing Coordination of Public Science Resources (Research Coordination)**

In the past year we have visited all the soybean research facilities in Ontario, including the Departments of Plant Agriculture, Molecular Biology, Food Science and Nutrition, and Ridgetown College at the University of Guelph, Lab Services University of Guelph, the Guelph Food Technology Centre, Agriculture and Agri-Food Canada (AAFC) research centres in Ottawa, Guelph, Harrow and London, The University of Ottawa, The University of Windsor (Bio-diesel chair) and a private research company (Performance Plants) in Kingston. During these meetings we gained an understanding of the research being done in the public sector on soybeans, received input into potential directions for our program, and shared our analyses of potential new market opportunities.

We organized and chaired a meeting of all the soyfood researchers in Canada and collectively reviewed existing research programs, equipment capabilities and expertise, and future research directions. We agreed to lead the development of a Canadian soyfood research vision statement, work towards improving communication within the community, and between the community and industry, and work towards standardizing protocols across labs.

We have worked closely with the Guelph Food Technology Centre (GFTC) and the Canadian International Grains Institute (CIGI) on their successful application for funding for developing research capability in the area of soy protein as a food ingredient. We see this fund as a potential catalyst for bringing the end use industry together with seed companies in developing a first mover advantage for this opportunity in Canada.

We worked with Dr. Brian Miki (AAFC, Ottawa), Dr. Doug Johnson (University of Ottawa), and Drs. Mark Gijzen and Dan Brown (AAFC, London) to build a Natural

Sciences Engineering Research Council (NSERC) strategic proposal aimed at developing the use of soybean hulls as a delivery system for industrial enzymes. We are continuing to work with this group to broaden their funding base, and to integrate their efforts with specific companies.

We have spent some time exploring the possibility of developing a central molecular breeding facility involving publicly developed molecular markers (AAFC, University of Guelph) with molecular marker developers and public and private soybean breeders. These discussions are ongoing.

We have worked with the Departments of Plant Agriculture and Land Resource Management, at the University of Guelph on the development of a Canadian Foundation for Innovation (CFI) application focused on building the capability to screen germplasm for useful variation for industrial applications. This has involved organizing tours for University of Guelph professors to bio-based industries such as Commercial Alcohols Inc. in Chatham. This effort will culminate in the delivery of a CFI application in the spring of 2004.

With Dr. Gord Surgeoner (Ontario Agri-Food Technologies) we organized a tour of bio-based companies in Ontario with senior research managers from AAFC and National Research Council (NRC). This tour was aimed at raising awareness that bio-based industry is not something that is projected to happen, it is real and there are companies in Ontario that are developing these opportunities now. It was also an opportunity to build linkages between AAFC and NRC, and between these research drivers and industry.

### **3. Coordination Along the Whole Value Chain (Opportunity capture)**

#### **Bio-diesel**

Bio-diesel was identified as key value added opportunity for Canadian soybean producers. We have been working under confidentiality agreements with companies interested in developing bio-diesel manufacturing capability. This work has involved economic analysis of the entire process including assistance with assessing capital and operating costs, and determining the feasibility of scaling up newer technologies. Soy 20/20 identified potential new synergies between ethanol and bio-diesel production that have the potential to improve the profitability of both. We have shared these concepts broadly and are working with companies and researchers to understand their feasibility. Enhancing the profitability of bio-diesel production will help to persuade companies to make the necessary capital investment, and persuade investors to fund such initiatives. One of the key opportunities in this area is to improve the value of co-products. We have worked with companies and researchers to assess potential opportunities for glycerol, and to stimulate research on further developments in this area. We identified a process invented in the 1930s which uses glycerol to remove excess water from ethanol and have been exploring the potential cost-savings that such an approach could have. A key value constraint to ethanol production continues to be market opportunities and pricing of the dried distillers grain and solubles. We have discussed possible means of increasing the value of this product through the addition of soy meal, or soy protein concentrate with research teams throughout North America. We identified a potential value for the high levels of sucrose in soybean as a feedstock for ethanol generation.

Biox Corporation has been attempting to commercialize technology that would enable the cost effective conversion of rendered animal fat into bio-diesel. We are working towards the development of models based on technical and

economic factors to identify and manage optimum mixture levels of bio-diesel based on various feedstocks. Given all of the above, coupled with our close integration with the supporting industry we are confident that we are moving along a road towards the development of an economically sustainable bio-diesel production industry in Canada. The development of such a stable industry will be globally competitive and ensure a sustained long term demand for Canadian soybeans. We are exploring the potential of a bio-diesel soybean, to add value to the processors and the producers.

### **Soyfood**

We identified soy protein as a food ingredient in North America as an important opportunity to focus on. To this end we have been working with two companies interested in developing this opportunity through the development of a manufacturing capability in Ontario. The first of these, Lomax Technologies Inc. has developed a patented position on the production of a novel, textured soy and wheat protein, meat analogue. Their product represents a significant improvement over existing vegetable protein based meat analogues through the incorporation of a fiber structure. The mouth feel of the Lomax meat analogue is similar to chicken. We have worked with them to identify and negotiate lease terms for a manufacturing facility in the Guelph area. We are currently working with them to obtain the capital necessary to move forward with their plans. Our efforts in this regard include working closely with them to develop a CanAdapt proposal for an interest delayed loan, positioning their proposal with the Farm Credit Corporation, interacting with Judy Seyler, Ontario Ministry of Agriculture and Food (OMAF) in regard to building partnerships and linking them into the existing Ontario food production business. This latter aspect has included meetings between Lomax and several significant food companies in Ontario. Dr. Gord Surgeoner (OAF) has been instrumental in facilitating interactions with potential private investment.

We have also worked closely with Functional Gourmet Foods Inc. of Vaughn, Ontario. This company produces a line of soy enhanced baked goods under the product name "SoyAlive", and have obtained contracts with a number of food retail companies, both grocery stores, and direct food outlets. Their product line includes muffins, bagels, cinnamon buns, and frozen pizza (including a soy based cheese in their pizza toppings). We have worked with them to develop a proposal for CanAdapt to enable them to market their products more effectively. We will work with Bill Robinson, AAFC, to develop a proposal under the Program for Export Market Development (PEMD) to assist them with their marketing efforts in the Pacific Rim. In addition, we are working with Functional Gourmet Foods Inc. to build the SoyAlive business case and attract investment to enable them to expand their manufacturing capability.

Our market analysis demonstrated that there is tremendous economic potential for Canadian soybean growers through the increased incorporation of soy protein in mainstream foods. We have been working with large commercial bakeries to provide information regarding soy protein functionality and benefits. This is a networking effort that will take time to build the necessary levels of trust to be effective. We are also working with a number of companies interested in building or expanding soy protein processing capability in Canada. At this point, most soy protein used in food is being imported into Canada from U.S. suppliers. We need to build an entire value chain involving seed companies, farmers, grain handlers, protein processors, food ingredient manufacturers, food companies and retailers to realize this opportunity. Our initial efforts have focused on food ingredient companies and potential protein processors.

## **Bio-based Industry**

Soy wax candles represent a surprisingly large market opportunity for Canadian soybeans. Retail sales of candles in Canada in 2003 is estimated at a value of over \$350 million. This represents the use of 29 M lbs of paraffin wax. Soy wax has started to make significant inroads into this market, and could potential make up at least 10% of total sales. Soy 20/20 organized a meeting involving candle manufacturers in Ontario, and Cognis, a Toronto based fatty acid company with the capability of manufacturing soy wax. With the help of this group we identified the constraints to growing this market in Canada and agreed to work together to promote the increased production of wax from Canadian soybean oil, as well as to work together to provide a consistent and clear marketing message for these products. This is a prime example of how Soy 20/20 can act as a catalyst bringing companies together to focus on the development of a value chain based on Canadian soybeans.

We identified soybean peroxidase as a significant market opportunity, but realize that Canadian companies are constrained by the existing U.S. patent position. We are identifying companies that are potentially interested in pursuing this opportunity, and providing them with assistance to negotiate licensing terms with the patent holder.

We also identified polyurethane as a significant soybean market opportunity, and have been working to persuade U.S. companies engaged in the development of soybased polyurethane to establish a manufacturing presence in Canada.

We were approached by a cleaning supply company interested in evaluating Canadian sources of methyl esters derived from soybean as a potential replacement for limonene as a solvent in cleaning supplies. We provided samples to the company and are continuing to look for ways to satisfy their needs.

In collaboration with Dr. Gord Surgeoner (OAFT) we successfully obtained \$300,000 in funding from CARD to assist bio-based companies with the development of business plans. We identified six companies interested in working with us to develop plans based on the expansion of their existing bio-based product lines, or the development of new product lines.

Our interactions with companies have had a common recurring theme, entrepreneurial spirit is not lacking in Canada, technical constraints can be overcome, and companies require the most assistance with obtaining investment capital in order to build manufacturing capability. Over the last year we have built relationships with public and private funding bodies, and are developing networks and formulae for successfully stimulating this industry. In the future the establishment of these networks will provide a solid basis for our ability to capture opportunities in Canada, and to continue to build increased demand for Canadian soybeans. The capital investment necessary to achieve these objectives exists. There is however, a pressing need for an organization such as Soy 20/20 to act as an interface between companies that are busy making ends meet month to month, and investors unfamiliar with the novel opportunities that they are being presented with. The development of successful funding partnerships will help to build confidence within the investment community, and stimulate local small companies to grow and try new things. In our first year of operation, we have focused more on the development side of research and development. It is our impression that the realization of opportunity is not currently limited by global research efforts, it is limited by local development opportunities.