Innovative Investment in Alberta's Agriculture & Food Industries

ACIDF
Alberta Crop Industry Development Fund Ltd.

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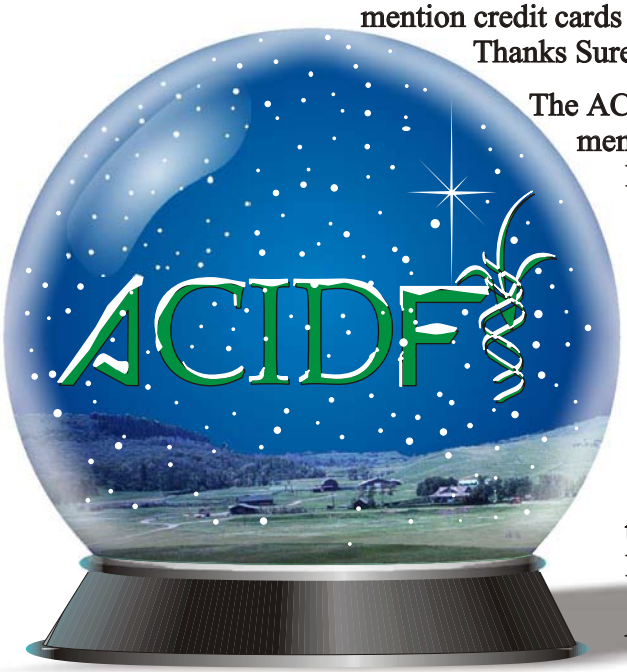
Merry Christmas & Happy New Year

From the ACIDF Board & Staff.

Christmas season is suddenly upon us and another year draws to a close. The year 2002 AD has been challenging at all levels, and it is those challenges that make life memorable.

One of our fondest memories is that of working with the Funding Consortium. The ability to team up with five other funding agencies has not only been effective, but has been a source of collaboration and comradery as well. The people we work with directly, almost day-by-day are thorough, fair-minded, and dedicated to our industry. The consortium wouldn't be what it is today without the concerted effort from Freda Molenkamp (AARI), Darcy Fitzgerald (ALIDF), Bill Buchta (DLFOA), John Christensen (Ag & Food Council), and Ross Bricker (AVAC). We also need to acknowledge Don Macyk and Alan Hall for their tireless commitment to the consortium process. We look forward to working with these folk again this year, with hopes of an expanded round-table process in the works.

Our feature article this issue, is a good example of that funding consortium at work. Dr. Suresh Narine sends us an excellent article on plastic at Christmas, and believe it or not, he doesn't mention credit cards once! More importantly Suresh speaks of an optimistic future. Thanks Suresh!



The ACIDF grant portfolio has grown and diversified, another pleasant memory. We have supported 38 projects thus far, from pasture to the laboratory, and from the environment to the dinner plate. Guiding these grant disbursements is our corporate strategy, developed from our signatory organizations and updated over the summer this year. The most recent document is available on our web page.

Speaking of our web page, it has been expanded based on feedback from people like you. We've streamlined its design too, to make finding that information easier.

Just for Christmas, the animated version of the snowglobe is on the web. If you have any guesses where the farm in the globe is located, drop us an e-mail.

From all of us, we wish you the best of the season!

What would Christmas be like without Plastic?

By Dr. Suresh Narine, U of A

Whew! How time flies when you are having fun. The holiday season is upon us again, and as we scramble to do all of the things that make this season as special as all those that have gone by, we, as Albertans, Canadians and citizens of the world are being buffeted by winds of change that will mean that traditional holidays like the Christmas season may change in wonderful and strange ways.

The most notorious way in which the world has changed is of course the much clichéd "September 11th" atrocity, and as the threat of another war in the mid-east looms threateningly on the horizon, other drivers of change in the world may go relatively unnoticed. Of course, the Kyoto Accord has received much coverage in our province, due to the threats that it may pose to our lucrative oil and gas industry. Clearly, people the world over are becoming more concerned about the environmental impact of our way of life and livelihood, and the European Union seems to be leading the way in endorsing such plans as the Kyoto Accord. Of course, economies like ours which depend so heavily on oil and gas reserves are prudent to take a more measured, though not necessarily less environmentally sound, approach to such accords. At the same time, it is important for our province to begin to think about the fact that our fossil fuel reserves, whilst still comparatively vast, are finite. We will need to begin to lay foundational plans for the days ahead when these resources begin to dwindle. Based on recent usage trends versus the rate of discovery, the rate of utilization of fossil fuels will be greater than the rate of discovery by 2010. What is important for us to realize, is that by clever exploitation of our impressive infrastructure in the oil and gas and petrochemical industries, and our immense agricultural industry, we can begin to address issues of dwindling fossil resources, environmental impact, and economic sustainability. These are large, grandiose times, when the future, not just environmentally but economically, may be written by the choices we make now.

A not so small subset of the changes that can be made to our economic and environmental benefit is the production of plastics from renewable agricultural sources. Almost all of the plastics currently produced are from fossil fuel derived feedstock. Clearly, as oil and gas reserves dwindle, the cost and availability of such feedstock will be severely affected. Furthermore, a very large percentage of the plastics produced from fossil fuel feedstocks are non-biodegradable. Many potential plastics from agricultural feedstocks have much more improved biodegradability properties.

As the threat of another year of drought manifests itself in a distinct lack of snow on the ground and we contemplate a Christmas without the white stuff, it is interesting to ask what our Christmas would be like if suddenly all of the items made from plastic were absent. For plastics are so ubiquitous in our environment, it is quite impossible to find a room in everyday life, much less Christmas, where some form of plastic is not contained. If you are like me and have small children who absolutely love having a tree and presents under it to tear apart, then a plastic-free Christmas is just not tenable (we have 2 year old triplets - try telling them that this year mom and dad decided plastic is not earth-friendly). If you have an artificial tree, its almost all made of plastic, 99% of most toys are plastic, the carpet on which the tree sits is plastic, a significant

percentage of the clothes we wear is plastic, most homes have upwards of 75% made from plastic material, etc. etc. In fact, the world consumes approximately 140 million tons of plastics every year. This is a staggering amount, and to put it in context of the oil reserves that is used to make this amount of plastic, it takes approximately 150 million tons of fossil fuels to make 140 million tons of plastic - and this accounts only for the primary processing of the plastic, not for the millions of tons of fossil fuel that is used to further process the plastics into toys, Christmas trees, carpets, house siding, insulation, car panels, and a host of other commonplace items that we take for granted. Clearly, then, there is a wonderful market opportunity here! If we are able to manufacture plastics, which are competitive on a performance, price, and biodegradability basis, there is a great opportunity to marry our pertrochemical expertise with our agricultural expertise to create an industry of agricultural plastics. Furthermore, this industry can be made more environmentally sound.

As a colleague, Dr. Maurice Moloney has put it, at the heart of the matter is the humble carbon-carbon bond. The only difference between carbon-carbon bonds that we can grow using nature's bounty of sun and water and carbon dioxide through the process of photosynthesis, and fossil fuels, is that fossil fuels have lain in the earth for approximately 500 million years. Therefore, using agricultural sources of carbon-carbon bonds to replace those that originally came from plant sources 500 million years or so ago, we are just bypassing the storage period!

There are a number of different plastic varieties which can be made from agricultural feedstock. There are the agricultural polyesters, such as poly hydroxy alkanoates (PHA), which can be produced bacterially and can be bio-engineered directly into plants, so that the plastic materials may be harvested from the plant. Another example of an agricultural polyester would be poly lactic acid (PLA), which is produced by fermentation of carbohydrates - the most popular example of this are the biodegradable plastics produced by a Dow-Cargill joint venture. Another form of plastic-like structural material from agricultural sources are composites of forestry and agricultural fibers such as flax, with traditional plastics such as high density polyethylene. Such materials are increasingly being used in Europe as automobile paneling, insulation materials, and structural materials for cupboards etc. in the construction industry. Other agricultural sources of plastics are lignins from sources such as flax, oils from oilseeds like canola, flax and soy, and plant and animal proteins.

Setting up new equiment in Dr. Narine's U ofA lab.

The methods to produce such plastics may be by chemical modification of agricultural feedstock, by fermentation of the feedstocks, or by genetic engineering of plastic-producing traits right into the plants themselves. There are advantages and disadvantages for all of these methods, but they all must produce plastics which compete with traditional plastics in terms of price, performance, and biodegradability. The amount of scientific focus on this area in the world is immense, and in order to leverage our significant advantage over our European counterparts in terms of our larger agricultural acreage, we are under some amount of pressure to ensure that we can deliver some made in Alberta solutions to the challenge.

This is why the Alberta Crop Industry Development Fund (ACDIF), AVAC Ltd., Alberta Agricultural Research Institute (AARI), the Agriculture and Food Council (AFC), Alberta Agriculture Food and Rural Development (AAFRD),

Alberta Economic Development (AED), Agriculture and Agri-Food Canada (AAFC), Environment Canada (EC), the Alberta Canola Producers Commission (ACPC), and the Natural Science and Engineering Research Council have teamed up to fund the Alberta Bioplastics Network (ABN). In fact, the ACIDF has stepped up mightily to the plate and funded the ABN to the tune of $450, 000 over three years.

The Alberta Bioplastics Network(ABN) is a multi-institutional research network whose mandate is to engage in activities to promote the use of Alberta's agricultural commodities as feedstock for the production of specialty chemicals and polymers. The network is focused on four areas of activity: Fundamental Science, Scale up technology, Marketing, Investment and Business Development, and Environmental and Economic Policy and Regulations. Dr. Suresh Narine of the University of Alberta is the Director of the network, and chair of the Fundamental Science focus area. Connie Phillips of the Center for Agri-Industrial Technology, CAIT (a division of Alberta Agriculture, Food and Rural Development - AAFRD), is chair of the Scale up technology focus area, Mr. Edward Phillipchuk of AAFRD is the chair of the Marketing, Investment, and Business Development focus area, and Mr. Narine Gurprasad from Environment Canada is the chair of the Environmental and Economic Policy and Regulations focus area. The institutions that participate in the ABN are:

- University of Alberta
- Alberta Agriculture, Food and Rural Development
- Alberta Research Council
- Agriculture and Agri-Food Canada
- Alberta Economic Development
- Environment Canada
- Alberta Canola Producers Commission

For a full list of the members of the network, or for additional information, please contact our Business Manager:

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As other entities in this area begin to emerge, the ABN will collaborate and provide information

and expertise in its specific areas of strengths. One such group is the emerging Alberta Consortium for Industrial Crops, targeted at the genetic modification of plants to produce bioplastics.

Therefore, this Christmas, as you gather under the tree and the kids start to tear apart your carefully wrapped presents with glee, spare perhaps a thought for the ways in which plastic has helped make your Christmas a success, and the ways in which we can begin to take steps to ensure that we continue to put the smiles on the faces of our children, in a sustainable and profitable manner.

Merry Christmas!

Mailing List Update

Like most small companies, ACIDF does its best to keep in touch with our clients and partners. If you know of anyone who would like to be included in our notification list, or possibly someone who would like to be removed from our list, please let us know.

What Was Funded?

This is a common question for us. Until now we haven't had much to report because we are such a new organization. With our first year is behind us, and we have some grant contracts signed and some projects completed, we can share our list of successful projects.

The list is on our web page at www.acidf.ca. From the menu at the top of each page, click "Library" and "Project Listing" to access the list.

The ACIDF Newsletter is published as news is available.

Contact us through our website at www.acidf.ca, e-mail at doug.walkey@acidf.ca, or by telephone at 403 782-8034.