

Innovation Place Newsletter
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Commercialization of New Ag Biotech Products, Processes Enhanced by Twin Organizations

As public research funding continues to shrink, industry partners are playing an increasingly larger role in the development of new technologies, says Dr. Stéphane Dupont.

The emerging partnership of research organizations, commercial corporations and government is now being strengthened by two organizations based at Innovation Place - the BioProducts Centre and the Canadian Value Added Cereals Consortium, located within the Ag-West Biotech offices at 101 - 111 Research Drive. Dupont is the director of both organizations.

Both are member-funded, non-profit organizations, focused on research and development activities which have a strong potential for commercialization.

The BioProducts Centre and the Canadian Value Added Cereals Consortium were founded in 1995 and 1996 respectively by Peter McCann, now president of Ag-West Biotech Inc.

The concept behind both organizations is similar; only the areas of specialization differ.

The BioProducts Centre works to facilitate the discovery, development and commercialization of biological agents for use in crop and environmental protection and plant growth enhancement, including bio-pesticides, bio-fertilizers and bio-remediation products.

Its founding members include the University of Saskatchewan, Dow Agro Sciences Canada (formerly Dow Elanco Canada), Philom Bios, Sask. Wheat Pool, Ag-West Biotech, the University of Guelph, the Agriculture and AgriFood Canada Saskatoon Research Centre and Nova Scotia Agricultural College.

"We have members from industry, academia and government research organizations, and we are always looking for new ones," says Dupont.

"With CVACC, the focus is on value-added cereal products and processes," says Dupont. "This can range from engineering a particular value-added trait into a cereal crop, to developing a novel processing technique to make use of a particular component of a cereal that would result in added value."

The founding members of CVACC are Dow Agro Sciences, NRC/PBI, AgrEvo, Sask. Economic Development, AAFC-CRC, SRC, Ag-West Biotech and the U of S.

Each organization works through a Board of Directors, comprised of representatives from member industries, research organizations and academic institutions.

Proposals for research projects in the area of biological control or bionutritional agents for agriculture are forwarded to the BioProducts Centre. Proposals for research into the development of value added cereal grains or grain processing techniques are sought by the Canadian Value Added Cereals Consortium.

"These proposals are screened by the Board of Directors of each group," says Dupont. "The proposals are evaluated for their scientific and technical soundness, and their commercialization potential - including production feasibility, patentability and potential for registration. All of these factors are taken into account."

The most viable projects are then analyzed for their ability to attract industry attention and funding. "We also try to assess whether the project would qualify for matching funding from various government initiatives," says Dupont.

The next step is to assemble a team of research scientists, industrial partners and others, to develop each project.

"We put a lot of emphasis on collaborative work. We see a lot of value in a research project being facilitated at several laboratories. They often approach the same problems from different angles," says Dupont.

The BioProduct Centre's first project got underway in April of 1995, involving the development of a biological control agent for dandelion and broad leaf weeds in turf. "Several of the member laboratories had either already started or were interested in starting work on this aspect of dandelion biocontrol. There was also a lot of interest from member industries to see this project go forward," says Dupont.

To date, the project has involved a team of 25 participants and a budgeted investment of \$3.25 million over five years.

"It's doing very well. We've gone through the process of evaluating a number of fungal dandelion pathogens, diseases of dandelions that could be increased to the point where they could control dandelions," says Dupont.

Screening was conducted during the first year of the project; the second year involved preliminary evaluations of several organisms. The third year saw collaborative field trials based on the selection of the organism deemed most likely to control dandelions, determining its rate of efficacy.

"We had a meeting at the beginning of December to evaluate those field results and review the project to date. Now Dow Agro Sciences and Sask. Wheat Pool have started evaluating registration requirements, production feasibility, production costs, market share - all the various aspects of commercialization," says Dupont.

"On paper, it looks very good. It looks commercially feasible, efficient, very safe, so there shouldn't be any major hurdles for registration."

The first project to be undertaken by CVACC involves the development of cereal hybridization technology by NRC/PBI and AAFC/CRC with financial participation from several agricultural biotechnology multinationals.

"It's a molecular engineering-based approach to making hybrid wheat." Characteristics of the hybrid wheat will include higher yield.

"For various reasons, wheat has been lagging behind other crops in terms of hybridization development and genetic engineering, but this is about to change," says Dupont.

The project has triggered interest from some of the largest seed biotechnology companies, including Monsanto, AgrEvo, Novartis, Zeneca, DuPont, Cargill and Dow Agro Sciences.

Traditionally, wheat hybridization has been considered a fairly high risk area of research. However, with so many partners involved in the project, a sizable pool of industrial funding has been established which can be used as leverage for matching government funding. "Everyone is sharing the risks, sharing the rewards," says Dupont.

The laboratory research for the project should start within the next few weeks.

Dupont brings to his position as Director of both organizations a Ph.D. in Environmental Chemistry. His international experience includes three years spent in England conducting environmental fate studies on new pesticides for the ag chemical industry. After returning to Canada, he completed a one-year visiting fellowship with Forestry Canada on bio-herbicides for forestry use. "I then came to the U of S and did a research project on herbicide resistance in agricultural weeds. In one guise or another, I've been working on pesticides, and more specifically, herbicides and weed control, since my Ph.D.," says Dupont.

His role with both the CVACC and the BioProducts Centre is multi-faceted. "My function is to make sure that things work as well as they can. Anything I can help with, I do. That goes from soliciting new members and proposals, helping with the evaluation, forwarding invoices and writing reports to co-ordinating the team effort to make sure the research organizations work in tandem," says Dupont. "Basically, it's project management."

Dupont is pleased with the achievements of both organizations to date. "A lot hinges on the projects, because they are quite large in scope. The dandelion bio-herbicide project, for example, has taken a lot of effort on the part of the BioProducts Centre to manage. There are two sides to that.

"On the one side, it is our flagship project and it's going very well. On the other side, if it keeps going forward, it will become a 100 percent industry project, and the BioProducts Centre will pass on the torch to an industrial partner who will take it to commercialization.

"So we'll need to look at new projects, and are actively soliciting research proposals."

Dupont says that being located at Innovation Place is a real plus in making connections with the scientific community at the research park, the University of Saskatchewan, AAFC and PBI. "A lot of our industry members are also located at Innovation Place."

Working from the offices of Ag-West Biotech has also afforded the two organizations many advantages. "The logistical and administrative support we receive is extremely important to the life of the two centres," says Dupont. "The human environment is also very important. I feel very much a part of the family here, and receive a lot of valuable information from the Ag-West Biotech team."

Transitional Funding Approved for Saskatchewan Accelerator Laboratory

Natural Resources Minister Ralph Goodale, on behalf of Ron J. Duhamel, Secretary of State for Western Economic Diversification, recently announced \$1.32 million in transitional funding from Western Economic Diversification Canada for the Saskatchewan Accelerator Laboratory (SAL) at the University of Saskatchewan.

This WD funding will allow the Accelerator Laboratory to continue its operations and concentrate its resources on work to further the Canadian Light Source (CLS), or synchrotron, project until funding decisions are made by the Canada Foundation for Innovation (CFI). The funding is subject to necessary approvals and will be directed to the SAL through the Natural Sciences and Engineering Research Council (NSERC).

"This is an important step that has to be taken in the bid for the CLS, one that could result in tremendous economic benefits both provincially and nationally, if the proposal is approved," said Natural Resources Minister Goodale. "I look forward to working with all of the partners involved in moving the synchrotron project towards completion."

"The WD contribution demonstrates our commitment to diversifying the western Canadian economy through innovation and technology," said Secretary of State Duhamel.

The \$1.32 million is in addition to \$500,000 in transitional funding that WD provided to the Natural Sciences and Engineering Research Council (NSERC) for the Accelerator Laboratory in the 1996 - 1997 fiscal year.

"The WD funding will allow the Saskatchewan Accelerator Laboratory to phase out its subatomic physics work and retain its staff to undertake detailed engineering design work, research Canadian supply sources and move design implementation forward on the CLS project," said Bernard Michel, Chair of the CLS Collaborative Committee.

The Canada Foundation for Innovation (CFI), an independent organization funded by the Government of Canada to provide support in health, environment, science and engineering for post-secondary educational institutions and research hospitals, is expected to make decisions on whether to fund part of the capital costs for a synchrotron light facility in the fall of 1998.

Synchrotron light is generated by using strong magnets to accelerate electrons which are traveling near the speed of light. The light is millions of times brighter than X-rays and has a very defined beam that can be pulsed for use in basic and industrial research.

Applications include research in materials science, environmental science, engineering, pharmaceuticals, medical diagnosis and treatment and biotechnology.

Canada is the only G7 nation without a synchrotron light source. As a result, Canadian scientists are forced to use synchrotron facilities in other countries in order to conduct research requiring synchrotron light. Access to these facilities is becoming increasingly difficult as some have instituted user fees and waiting lists.

The total estimated capital cost of the project is \$155.6 million. The Canada Foundation will contribute up to 40 percent of capital costs to selected projects. The remaining 60 percent of capital funding and operating costs must be raised from other sources by project proponents.

Exciting Times Ahead for Ag Biotech Investors, Says Analyst

"Agriculture is in the midst of a genetic revolution that is very exciting from a Wall Street perspective," says David Nelson, food and agribusiness analyst with Credit Suisse First Boston in New York.

"The advent of transgenic seeds is driving a value shift in stocks from the ag chemical industry to the agricultural biotechnology and seed industry. Over the next three years, we estimate that genetic innovations will drive a compound annual earnings growth rate of up to 40 per cent for seed companies that are 'technology haves'."

Determining how to be a winner in this 'value revolution' will be the theme of David Nelson's presentation at the Agricultural Biotechnology International Conference (ABIC '98). The conference, themed "Ag Biotech: The Science of Success," runs June 9 to 12 in Saskatoon. It focuses on strategies for commercialization of ag biotech products.

Nelson says that the pace of innovation in ag biotech is intense. "Significant new developments happen every day. Last month, France approved the planting of transgenic corn, Cargill and Dow announced a major joint venture to produce plastic resins in plants, and Monsanto acquired the largest seed company in Brazil. The genetic revolution is marching forward. Investors are looking at ag biotech stocks because they stand on their own economic value despite ups and downs in global financial markets."

For more information about the ABIC 98 conference, contact Peter McCann at (306) 975-1939 or Sharon Murray at (306) 934-1772.

Updates

IP Green Team Tip

The Innovation Place Green Team urges you to pack a "garbage-free" lunch, and help reduce the amount of material entering the Saskatoon landfill. One suggestion - use washable cutlery instead of disposable!

Toastmasters Speak Out

Do you find it difficult to prepare and deliver a presentation? If you do, turn to Toastmasters for help. For more information on Toastmasters, come to the Saskatoon Toastmasters Club

450, Fridays at 7:00 p.m. Meetings are held at 410 Downey Road (the L.F. Kristjanson Biotechnology Centre.)

For more information about the Toastmasters program, call Jake at 373-3390.

24 Hour Relay Date

The date has been set for the 1998 24-Hour Relay for Easter Seals. The fund-raising event will once again be hosted by Innovation Place on June 13 and 14. For preliminary information, call Carrie Olson at the Saskatchewan Abilities Council, at 374-4448.

Research the Driving Force for Healthier Saskatchewan Hearts

How is the human heart like the engine of a car? Both are equipped with ignition systems that provide an all-important spark.

In the heart, the "ignition system" is a mass of specialized nerve cells that use electrical impulses to make the heart muscle contract. If this natural pacemaker is defective the heart cannot pump blood properly.

Over the years, scientific research has produced a growing inventory of "spare heart parts" designed to correct this and other serious malfunctions.

In the 1950s, a Canadian discovery led to the eventual development of one of modern medicine's great "spare parts", the pacemaker. This small electrical device has since been refined to the point that it can now respond to exercise, and can be used even to help young children with heart rhythm disorders.

Canadian research is responsible for a host of other heart and stroke treatments that can justifiably be called breakthroughs. Thousands of Canadians now entering adulthood are alive because a Canadian scientist developed surgery to correct the hearts of "blue babies". People are surviving heart attacks more often and with less damage to the heart muscle because a Canadian researcher discovered the clot-busting properties of the drug heparin. Canadian research discovered that the heart actually produces a hormone which can lower blood pressure. And high-risk Canadians may never have a heart attack or stroke because a Canadian discovered that something as simple as aspirin can prevent stroke and heart attack in certain people.

Here in Saskatchewan, research is the key focus of the Heart and Stroke Foundation. Three quarters of cardiovascular research at the University of Saskatchewan is funded through donations to the Heart and Stroke Foundation, and this "made in Saskatchewan" research is continuing to make tremendous progress.

Currently, researchers funded by the Foundation are at work looking at the root causes of high blood pressure, so that it can be stopped before it causes a stroke or heart attack. Bypass surgery, one of the most common of cardiac operations, may become even safer thanks to the studies of a Saskatchewan researcher. And researchers here are developing

ways to protect brain cells if stroke occurs, and are looking at new treatments that will reduce the paralysis and loss of speech that often follows a stroke.

Dr. Tom Wilson, Chair of the Medical Advisory Committee of the Heart and Stroke Foundation, says that this type of research in Saskatchewan is on par with that being done anywhere.

"All Saskatchewan heart and stroke researchers submit proposals for their projects, and these are rated by a national committee. Only those projects with high ratings receive funding from the Heart and Stroke Foundation of Saskatchewan. On the other hand, dollars raised by the Foundation in Saskatchewan are spent only in Saskatchewan. Thus we have the best of both worlds: supporting excellence and supporting local research."

Wilson describes other spin-off benefits of this research spending, noting that "because we are able to fund these top-notch researchers, we are able to keep them here at our University. This has a positive effect on the teaching and service program at the U of S.

"It also helps bring in other research dollars. For example, Saskatoon researcher Dr. Jerry Yager, who is studying stroke in babies and children, was recently recognized as Canada's highest ranked researcher into stroke. His award brought with it significant funding from outside Saskatchewan's Heart and Stroke Foundation funding helped bring even more dollars for stroke research into our province from elsewhere in Canada," explains Wilson.

You can become part of this tremendous work, by supporting Heart and Stroke Foundation when a canvasser comes to your door in February. To find out more about the research and education programs that will give the gift of time to Saskatchewan hearts, call the Foundation at 1-888-HSF-INFO.