

OPINION: BIOTECHNOLOGY

# Harnessing the benefits of technology

Scientific communication, public education and international law are a few other adjunct disciplines that go hand in hand with biotechnology. Importantly, knowledge management is key to the success of scientific and technological endeavours. In this regard, IICA is a proven and strategic catalyst.



BY AUDIA BARNETT

**O**TTAWA—Canada together with the rest of the Americas is being eyed as the knight in shining armour—to save the world from inadequate food supplies in the future. Statistics and data on the availability of arable land worldwide support the notion that the Americas is best placed to produce the food needed for the nine billion population anticipated come 2020.

How is this going to be achieved? Acknowledging that science, technology, and innovation are pivotal for sustainable agriculture, organizations such as the Inter-American Institute for Co-operation on Agriculture (IICA) have been exploring means available for sustainably improving productivity and quality of agricultural commodities. IICA, being the single most consistent entity dedicated to addressing food security and rural development in the Americas for close to 70 years, is suitably positioned to provide amenable solutions.

Programs within this hemispheric body include organic

agriculture, biotechnology and biosafety, agricultural health and food safety and food security are geared towards responding to the imperatives of the times. This is not without difficulty as prevailing adverse conditions include the fact that in the Americas, food insecurity is on the rise, the production of biofuel from crops is a reality, food prices continue to escalate, and the world's economic giant is experiencing turbulent times.

Additionally, there is the backlash associated with agricultural development which occurs to varying degrees in Canada and the rest of the region: deforestation, increased greenhouse gas emissions, agrochemical runoffs and losses to biodiversity. The inter-governmental machinery that exists within IICA however presents opportunities for timely and appropriate responses. Representing thirty four countries, including Canada, IICA is extremely conscious of the collective responsibility relating to land use and the preservation of the rich biodiversity that is resident in the Americas, even while overcoming the real challenges of feeding the world in a scenario of climate change.

Biotechnology can be simply thought of as the use of living organisms or their products for

commercial production. It is one of the oldest tools available in applications ranging from health and the environment to energy and food. As with most scientific endeavours, strides have been made over the years to expand the range of applications. In health, for example, the development of vaccines and antibiotics including penicillin took place in the early 20th century, today, many home testing kits are based on biotechnology. Composting organic wastes is an early manifestation of biotech at work, whereas today, oil and chemical spills can be cleaned up using specially designed micro-organisms. Biogas production, another earlier biotech application is still quite relevant, with the advent of biofuels such as biodiesel and bioethanol being more current additions. In the area of food and agriculture, bread, wine, cheese, yogurt are all products of biotech at work. Modern biotechnology however has been able to produce crops which are resistant to certain pests or weeds.

Biotechnology is currently very much at work in countries spanning the length and breadth of the Americas. The multiplication of clean planting material for crop production is an application which is utilized in many countries of the Latin American and Caribbean

(LAC) region. Known as tissue culture, this is an important aid to the resuscitation of agriculture after natural disasters known to beset the region with increasing frequency. Similarly the conservation of important crops, some of which are indigenous to the region, is made possible by way of regional repositories known as gene banks. In addition to preserving the region's rich biodiversity, such uses demonstrate the potential to apply biotechnology in safeguarding the socio-cultural and economic well-being of populations in the Americas.

Other routine biotech applications in agriculture can be found in animal and plant diagnostic kits. These are rapidly becoming indispensable to the farmer for detecting diseases or the crops' disposition to diseases, before it becomes costly. The increasing use of gene sequencing, molecular markers and bio-screens provide additional evidence that the technology is being employed to optimize the value of current genetic resources as well as to improve sustainability and competitiveness of agricultural commodities in the region.

Biotechnology provides a powerful toolbox; its proper and efficient use will allow us to reach solutions to the current

and impending problems. This presents exciting prospects for students as a plethora of associated disciplines continue to emerge. These range from scientific research on the genome of various plants and animals to practical and necessary applications in medicine, industry and agriculture. The scope of disciplines such as biosafety, risk assessment and bioethics, for example, have expanded significantly as a result of modern biotechnology. Technologies such as nanobiotechnology, bioinformatics and genetic engineering typify the diversity of options based on an age-old technology. Scientific communication, public education and international law are a few other adjunct disciplines that go hand in hand with biotechnology. Importantly, knowledge management is key to the success of scientific and technological endeavours. In this regard, IICA is a proven and strategic catalyst.

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that Canada can be a world leader in generating jobs and investment in life sciences and the knowledge economy?

To do this, we need Canada to be one of the leading places where more new medicines and vaccines are developed to treat and prevent cancer, diabetes, Alzheimer's, heart disease and other conditions.

We need better tools, including world-class intellectual property protection that can help us turn innovative ideas into the next generation of new life saving or life enhancing medicine. These new cutting edge medicines will also help by reducing surgery, hospital visits and other health costs.

Canada is currently negotiating a comprehensive trade agreement with the

European Union (EU) that would put us in the unique position of being the only country in the world to have favoured trading status with both the Europeans and the U.S.

An internationally competitive intellectual protection regime for Canada is part of the discussions. A deal with the EU will preserve and create jobs in life sciences and provide a \$12 billion boost to the Canadian economy while increasing our bilateral trade by 20 %.\*

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\*[http://www.international.gc.ca/media\\_commerce/comm/news-communiqués/2009/386908.aspx?lang=eng](http://www.international.gc.ca/media_commerce/comm/news-communiqués/2009/386908.aspx?lang=eng)



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