



Impact Innovation 2012 Speakers Series

Speakers at Impact Innovation 2012 entertained and exchanged knowledge with more than 250 people from a “who’s who” in industry, academia and government on the solutions research and innovation can provide to the challenges faced by Alberta’s agriculture, food and forest industries.

In its second annual Impact Innovation event, Alberta Innovates Bio Solutions (AI Bio) hosted a variety of speakers in Edmonton and Calgary on May 16 and 17. They engaged the audience to think about how Alberta can make the province’s leading renewable industries, which already contribute more than \$25 billion each year into the economy, to become even more competitive, profitable, and sustainable.

Dr. Stan Blade



In his welcoming address, Dr. Stan Blade, Chief Executive Officer of AI Bio, asked the audience to not only think about the challenges that face Alberta, but also to think about opportunities and partnerships. During his introduction of Stephen Khan, Minister of Alberta Enterprise and Advanced Education, Blade joked that many “Trekies” were shocked to learn that “Khan has taken over the Enterprise.”

Minister Stephen Khan



Continuing on that theme, Minister Khan, Minister of Alberta Enterprise and Advanced Education, teased that indeed “Khan is now in charge of enterprise,” but said he hoped his legacy will go beyond that. In his first public speaking engagement after being appointed, Khan told the audience that this was an exciting time for the province, full of new possibilities. He spoke of a new focus for the Government of Alberta – a new way of carrying out business and of providing programs and services. During his tenure, Khan hopes to improve Alberta’s competitiveness in the global marketplace and use innovation to drive the province’s knowledge-inspired economy forward to make Alberta more productive.



Jay Ingram



Emcee Jay Ingram, well-known host of the Discovery Channel's *Daily Planet* and recipient of the Order of Canada, said he was excited that science was becoming more available and interesting to the public, stimulating the next generation of science journalists.

Ingram had two reasons for being at Impact Innovation:

- With the world's emphasis on innovation, and the push-pull of science, this was exciting times for Alberta and upcoming patents will lead to better things for its citizens; and
- It is important to hear from the researchers themselves because part of the challenge in explaining science is to overcome the impression that scientists are locked away in labs. Science is a dynamic adventure that shows off cool work with concrete applications.

Art Froehlich



Providing a global context for Alberta's bio sectors, AI Bio Board Chair Art Froehlich told the audience that the agriculture, food, and forestry industries used to work in silos and thought they had to solve all the challenges themselves.

Now, expertise from all sectors, including health, environment, and energy is being integrated and that expertise is being used globally. Froehlich made several observations including:

- Albertans have an obligation to respect, appreciate, and defend our heritage industries. We are indebted to our foresters, rangers, farmers, and researchers because they have pushed us to use their input to come up with excellent strategies for those sectors; and
- Alberta is facing a "perfect storm" with peak global prices for energy, food and water and high availability in Alberta. But we are also facing climate change and other issues. If we are not prepared to deal with these issues properly, we could end up like Lima, Peru, and other cities facing desert-like conditions.



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Mike Kennedy



Mike Kennedy, president and CEO of Green Analytics, an energy conservation firm, told the audience that unlocking the agricultural and forestry sectors' potential must be balanced with environmental sustainability. His company is working with AI Bio to pull together spatial biomass information because this information supports the delivery of provision services (e.g., clean water), regulatory services (e.g., government policy) and cultural services (e.g., recreational spaces.) Kennedy said:

- Land-use decisions are important and cannot be made without land-mass data. Costa Rica is an example of using land-mass data successfully in forest cover recovery.
- There are many information gaps in the biomass data and pulling together spatial biomass information is critical to understanding land-use patterns and how they affect the ecosystem.

When questioned about where these gaps exist, Kennedy explained that we have a good understanding of the green zone (public forested lands), but not as much knowledge about the white zone (areas set aside for agriculture, settlements and private property). He said our challenge is to meet society's needs and wants in an effective fashion.

Kennedy answered a question from the audience about whether his work includes research about water by saying his biomass data includes the study of water and water quality and considers existing legislation such as the *Land-use Framework* and the *Alberta Land Stewardship Act*. This biomass information, which he is updating over time, will become publicly available and will help form the basis for biomass decisions.

Dr. Janice Cooke



With an obvious passion for forests, Dr. Janice Cooke, Assistant Professor, Department of Biological Services (Forest Tree Biology), University of Alberta, has spent her career applying bio-technology to issues in forest biology. Cooke, who has an interest in the sustainability of natural forests, told the crowd of her work with forest genomics.

Just as using DNA sequencing helps medicine, forest genomics tell us what's going on with the forest and how it reacts to its environment. Cooke's work is helping the Alberta government monitor the Mountain Pine Beetle (MPB) infestation that has impacted both B.C. and Alberta. Cooke told the audience that:



- Northern Alberta has mixed forest types with scattered pockets of pine making it hard to find the leading edge of attack;
- Lodgepole pine and jack pine can hybridize to create lodgepole/jack pine hybrid offspring;
- Pine marker analyses revealed MPB expansion into the jack pine population that extends eastward into the rest of Canada, making the MPB infestation a nationally significant issue; and
- Because a massive MPB outbreak has potential to affect Canada’s eastern provinces, there have been interregional cooperation practically unheard of in resource protection sectors – all areas are working together to slow the spread of infestation.

While Cooke did not relish being the bearer of bad news, she said the silver lining is there, with her genomic analyses helping to accelerate good decision-making. In response to a question about whether it would be suitable to use genomics to grow trees with enhanced protection against MPB, Cooke replied that because so many genes are at play, it would be very challenging.

Dr. David Wishart



With more fad diets and more conflicting food information than ever before, Dr. David Wishart, a professor in the Departments of Biological Sciences and Computing Sciences

at the University of Alberta, made a very timely presentation to the audience.

“The Alberta Food Metabolome Project: What’s in Your Food?” is looking to answer questions people have about their food, such as why bacon smells so good, why seafood is linked to gout, why dogs can’t have chocolate, and why asparagus makes urine smell stronger - information that cannot be found in food labels.

Wishart’s research is looking at dozens of food products from Alberta food producers, measuring the thousands of compounds in that food, and making this information available in a publicly available food database (FooDB). Wishart said this FooDB will provide many things for Albertans including:

- Much-needed information about what is in our food – the good and the bad – as well as information about what to look for;
- Value-added information for producers;
- QR-code labels for quick access to online information; and
- Answers to many of the interesting questions people have about their food.

Questioned about the answers to some of those burning questions, Wishart explained amino acids (protein) react with the sugars in bacon, producing the aromatic smell, while asparagusic acid produces methanethiol, resulting in a less-than-aromatic smell in urine that some people can detect.

Wishart further explained the information in FooDB is consumer-friendly information that provides material that people want to know and that can also be used by drug companies and food producers. With regard to our looming obesity epidemic, Wishart said the idea of thinking about food in terms of flavour, aroma, and texture instead of just a calorie-loading system could be taught in schools and could be a driver for producers and restaurants.



Dr. Evelyn Merrill



Many Albertans have become familiar with prions and prion diseases, such as bovine spongiform encephalopathy (BSE) and chronic wasting disease (CWD), through some hard lessons.

Dr. Evelyn Merrill, University of Alberta Biological Sciences Professor, recognizes the potential devastation of disease-spread, but also says we are part of the solution. Merrill, a field scientist who shuns the white lab coat and has gone through about 60 pairs of boots during the course of her 35-year career, explains the efforts of CWD, a disease affecting cervid (deer, elk) populations in Alberta, Saskatchewan, and many states throughout the US. The disease, which literally wastes away the animal, was first identified in 1967, but it was 10 years later that we learned it was a prion disease. Merrill pointed out many of the challenges we face regarding CWD, including:

- The high susceptibility of all cervids;
- No available vaccine and 100% fatality rates;
- Many unknowns, including how long prions live in the environment, long-term population effects, potential threats to domestic livestock and humans; and
- It is a slowly developing disease with post-mortem tests being the most reliable.

Merrill’s work has focused on using the information about herd migration and animal behaviour to predict the spread of CWD. GPS technology has allowed researchers to track animal movements across the landscape to connect the dots. This information provides knowledge about where the disease will spread and allows researchers to cost-efficiently target surveillance and control programs. Merrill concluded that a paradigm shift is happening – we are moving from an attitude of conflicting interests to one of “one health,” a realization that human and wildlife health are interconnected within the health of our environment and ecosystem.”

Dr. David Bressler



Dr. David Bressler is Director of the Biorefining Conversions Network (BCN), which is supported by Alberta Innovates Bio Solutions and is based at the University of Alberta. The BCN has the goal of commercializing technology in biomass conversion and is becoming a research leader in bio-industrial processing and bio-products.



Bressler, who is also an associate professor at the University of Alberta's Department of Agricultural, Food and Nutritional Science, told the audience that Alberta is a sleeping giant and that AI Bio is leading the transition to wake us up. Citing huge technological advances that have changed the world, he said networks must reach out and engage the business world.

Bressler told the crowd about some of the goals BCN has, including:

- Keeping pace with global trends and becoming a world-class bio-industrial player;
- Adding economic diversity and value to our heritage industries by intersecting with other sectors including forestry, petrochemicals, chemical, agriculture, energy, and environment;
- Working with other sectors to do more than just process biomass but to actually use all the by-products of biomass feedstocks, similar to what is done with oil; and
- Developing drop-in chemicals and fuels compatible with petroleum products.

Bressler warned that Alberta must get its patent processes and long-term regulations right or face the hurdles US companies have experienced where banks wouldn't finance projects because government approval was only short-term. In response to a question from the audience about the six-year process for biomass research patents, he said there is a need to shorten the patent protection timeframe, but the upside is that hundreds of millions of dollars have been invested and there is a tidal wave of technologies about to be patented.

Conclusion

Stan Blade concluded the event by thanking the remarkable panel for their valuable work and calling on the audience to think more about the importance of Alberta's heritage industries and what they can do to support those sectors.

The two-location series was designed to bring together leaders of innovation from industry, academia, and government to stimulate new ideas about innovation in the forestry and agriculture sectors.

To view photos and powerpoint presentations from the 2012 sessions, visit www.bio.albertainnovates.ca/about/corpevents/impactinnovation2012/

Want to learn more?

Visit www.bio.albertainnovates.ca/about/corpevents/impactinnovation2013/ to learn more about the 2013 Impact Innovation session on May 15, 2013 in Edmonton.

Visit www.bio.albertainnovates.ca for more information on AI Bio.

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