

**KANATA  
EARTH**

Strictly Private & Confidential

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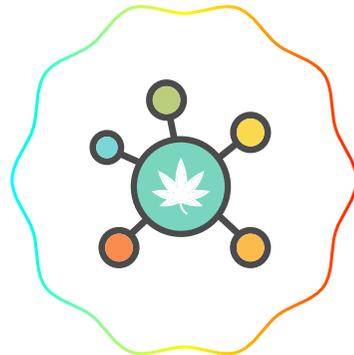
# The Cannabis Industry Today

Canada is a global leader, with a domestic market, supply chain and legal framework to support scaling and innovation.



## Cannabis Market

- 2019 market size of **\$7.17 Billion** for cannabis in Canada <sup>(1)</sup>
- **7 out of 10** of the worlds largest cannabis companies are Canadian <sup>(2)</sup>
- Forecast global market value of **\$194 Billion by 2025** <sup>(3)</sup>



## Ancillary Market

- Market potential of **\$22 Billion annually** for ancillary and cannabis market in Canada <sup>(4)</sup>
- Industry Components and Supply Chain:

### Growing

- Cultivation
- AgTech
- Real Estate

### Development

- Analytical Testing
- Medical Research
- Extraction/Processing

### Products

- Pharmaceuticals
- Dried Cannabis
- Cannabis Based Products  
(creams, topicals, edibles)

<sup>(1)</sup> Deloitte 2018 Cannabis Report <sup>(2)</sup> <http://marijuanaindex.com/> <sup>(3)</sup> BMO 2018 Report <sup>(4)</sup> Deloitte 2016 Cannabis Report



# What is Missing - Genetics

## The industry is built on a foundation of unstable and inconsistent genetics

Traditional commercial crops (e.g. tobacco) have been selectively bred for years to produce a stable and consistent crop with desirable characteristics.

Due to the black market origins of cannabis, the market suffers from a lack of variation and detailed scientific knowledge. It is common for two products with the same name to be completely different genetically.

Stability is lacking in cannabis genetics. If seeds or cuttings are harvested from a mother plant, the resulting plants will vary in size, shape, cannabinoid profile etc.

Today's medical cannabis varies from one batch to the next. This is not acceptable for any medical or consumer products.



**AURORA**  
**Temple**  
  
Hybrid  
**THC 0 - 2.00%**  
**CBD 7.00 - 16.00%**

**THC 0 - 2.00%**  
**CBD 7.00 - 16.00%**

Example of 'Medical' cannabis available today in the Ontario Cannabis Store (a Crown corporation)

“Cannabis contains a highly complex mixture of cannabinoids and terpenes, the pharmacology of which is very poorly understood. As a biomedical researcher involved in drug discovery, it is critically important that the product(s) that I am testing in my lab have carefully and explicitly defined quantities and concentrations of chemicals whether the product is a single isolated drug or a complex mixture of several potential drugs..”

Robert Laprairie, PhD, Assistant Professor, GlaxoSmithKline Chair in Drug Discovery and Development, College of Pharmacy and Nutrition, University of Saskatchewan



# What is Missing - Reproduction

## Today's reproduction process creates inconsistent, disease prone plants

- **Quality**

The most common method for cannabis reproduction, involves taking a cutting from a 'mother' plant and re-planting this cutting to form a new 'clone'.

There is a limit to the number of cuttings that can be taken from the mother plant before impacting its health.

Disease and pathogens (such as white powdery mildew) are easily passed from mother plants to clones.

Plant cells accumulate mutations over time. Therefore older mother plants become less vigorous and more susceptible to disease.

- **Consistency**

Mothers are replaced after a period of time, making it impossible to produce an identical crop.

i.e. different mother, different children.

**Today Canada cannot produce two identical crops**



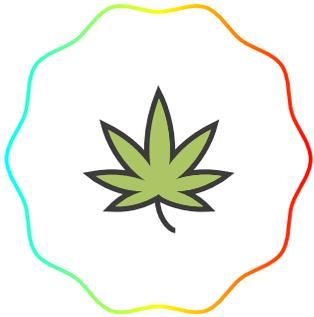
**Mother Room**



**Cloning Room**



# Threats & Vulnerabilities



**Regulators in key export markets are very unlikely to accept the quality of cannabis produced in Canada today.**

- Exports to key markets such as EU and US are likely to be driven by medical cannabis. Regulators in these markets will not allow import of a product that is inconsistent and lacking in quality, regardless of what is acceptable today in Canada.
- The lack of consistent and quality medical cannabis will accelerate growth of production and supply chains in other markets, ultimately creating competition for Canadian producers. If quality product was already available, foreign producers would have less incentive to enter the market.



**Once opened, markets with horticulture expertise will eventually solve the genetics & reproduction issue, leaving Canada behind.**

- Today advanced horticulture centres such as Holland, Germany and Switzerland are largely excluded from the cannabis market as the local supply chains remain unlicensed (Labs, processors, research centres), lacking in scale, financial resources and access to consumer markets.
- If Canada doesn't do it first, these countries will apply their existing knowledge base to solving the genetics and reproduction problem. Ownership of upstream IP and genetics will allow them to control and dominate the market.



# What is Kanata Earth?

**We are an indigenous owned cannabis company focused on plant genetics and production of clones from tissue culture.**

Our world class plant genetics team have the ability to stabilize existing cannabis genetics and develop complex strains with characteristics and cannabinoid profiles suitable for the medical market.

Stable and consistent genetics are key to the development of bio-pharmaceutical products and trusted brands.

Our tissue culture nursery will use proven Dutch technologies to provide Licensed Producers with consistent, quality cannabis clones, vastly reducing their risk of crop failure while improving their efficiency and profitability.



# Create + Multiply + Grow

## Enabling LP's To Produce Consistent Crops and Create Trusted Brands



### Genetic Enhancement & Research

- Stable and Consistent
- Genomic Database and Repeatable Breeding Platform
- Enhance Desirable Characteristics
- Higher Yielding
- Pest & Mould Resistant
- Protectable IP via Plant Breeders Rights



### Tissue Culture Micro-Propagation

- True to Type, Genetically Identical Clones
- Viral and Bacterial Free
- Pest and Mould Free
- Improved Health & Vigour



### Clone Nursery

- Hardened Rooted Plants
- Female Only
- Consistent Physical Characteristics
- Additional Crop Cycles for LP
- Space Saving for LP



# Why Tissue Culture?

## Production of genetically identical, disease free, pathogen free plants

Tissue culture is a process used for reproduction of plants under sterile conditions.

This process is used in existing commercial horticulture applications (banana, sugarcane, rice, potatoes, orchids, corn, soy, ferns and cotton etc.).

### Advantages:

- Genetically identical copies
- Infinitely repeatable
- Clones are disease free, pathogen free and pest free
- Increased growth rate and plant vigour
- Clones have consistent cannabinoid profiles
- Source genetics are permanently stored



Storage



Work Station



Tissue extraction



Placed in a sterile growth medium



Ready for transport and planting



# Partners and Collaborators

Working together with the top level institutions and partners



- University of Saskatchewan - Genomic research project carried out in conjunction with the college of agriculture.



- Saskatchewan Research Council - Analytical testing.

University of  
Lethbridge



- University of Lethbridge - Breeding and genetics research.



- Cannabinoid Research Initiative of Saskatchewan - Developing constant cannabis genetics suitable for application in clinical trials.



# Management Team



**Blaine Favel**  
CEO

Blaine has served in senior leadership positions in politics, business and post-secondary institutions.

He served as University of Saskatchewan's Chancellor from 2013-2016, was formerly the Chief of Poundmaker Cree Nation and Grand Chief of Saskatchewan.

Blaine founded the Saskatchewan Indian Gaming Authority and First Nations Bank. Previously he worked at the law firm of Bennett Jones and was an investment banker with RBCCM.

He has served on the Boards of the Calgary United Way, the University of Saskatchewan, the Calgary Homeless Foundation, and the Saskatchewan Human Rights Commission. Blaine has a law degree from Queens and MBA from Harvard Business School. He is noted on Harvard Business School's website as an "Alumni of Influence".



**Prof. Tim Sharbel**  
Director of Genetics and Research

Dr. Sharbel's research group (22 researchers) at the University of Saskatchewan investigates apomixis (asexual plant reproduction via seeds) in natural populations, using evolutionary theory, population genetics and advanced "omics" methods, with the goal of identifying apomixis factors for agricultural improvement.

Dr. Sharbel initially worked as a technician in an amphibian genetics laboratory at McGill University from 1987 until 1995 and simultaneously completed his BSc and MSc in evolution and biology at McGill. In 1995, he moved to the Max Planck Institute for Behavioural Physiology (Seewiesen, Germany), where he completed his PhD in Biology. In 1999, Dr. Sharbel moved to the Max Planck Institute for Chemical Ecology (Jena, Germany) to work on apomixis as a post-doc. In 2005, he began as head of the apomixis research group at the Leibniz Institute for Plant Genetics and Crop Plant Research (IPK Gatersleben, Germany).

In 2015, he became the GIFS Research Chair in Seed Biology at the newly formed Global Institute for Food Security, he is also full professor in the Dept. of Plant Sciences at the University of Saskatchewan, Canada.



# Management Team



**Terry Line**  
Chairman

Terry entered the cannabis industry four years ago while putting together the funding to start The Green Organic Dutchman, the global leader in producing certified organic cannabis. Terry was a former operator of a large Canadian Tire Store with over 63k products, 300 employees and \$40M in annual revenue. He has travelled globally to source parts and products for Canadian Tire, and other large global retailers.

Terry has travelled extensively to various cannabis-friendly and legal markets to learn what is working and what isn't and to meet with the industry's best and brightest. Terry is an investor in Perfect Plants the Dutch leader in tissue culture micro-prorogation.



**Shane O'Farrell**  
President

Most recently, Shane was Managing Director for Selina, one of the world's fastest growing hospitality companies who recently raised \$125M and operate 48 hotels across Europe, US + LATAM.

He was previously CEO of Lumichip, a technology company focused on manufacture of custom spectrum LED components for use in the horticulture, cannabis and biotech industries. Lumichip LEDs were supplied to some of the world's largest and most advanced agri-tech and seedling research companies.

He was Head of Property at Lidl ( Europes Largest Retailer), leading a team responsible for expansion and development. During his time at Lidl UK, the company became the fastest growing UK retailer, investing over \$1.25 billion annually into property expansion and opening a record number of new stores. Shane holds a Bachelors Degree in Engineering from University College Dublin.



**David Wagstaff**  
Chief Financial Officer

David is a seasoned financial executive with a broad range of experience in operational and financial restructuring, mergers & acquisitions and investment evaluation & analysis. Most recently, David was Vice President and CFO for Jetport Inc. the office of the Joyce family (Tim Hortons), a position he held for over 12 years.

Over the past 25 years, David has actively participated on a number of public, private and not for profit boards specializing in governance, compensation and audit committee roles. These roles include member of the Board of Just Energy Group, NRX Worldwide, Vista Broadcasting, and Reach Out Centre for Kids. David graduated from McMaster University with a Bachelor of Commerce, is a member of the Institute of Chartered Professional Accountants of Ontario and holds his Audit Committee Certified designation (ACC) obtained through the Directors' College.



# Management Team



**Dr. Marco Pellino**

Laboratory Manager

Marco completed his BSc and MSs in food science and technology (agronomy) at the University of Padua in 2007 and 2010 respectively. He obtained his PhD in 2015 at the Leibniz Institute of Plant Genetics and Crop Plant Research (IPK) with his work on asexual reproduction in plants. He later accepted the Lab Manager position under Prof. Dr. Tim Sharbel at the University of Saskatchewan.

He led the conceptualization, layout + implementation of the laboratory space at the Global Institute for Food Security. Currently manages 30 people in a multidisciplinary laboratory.



**Prof. Igor Kovalchuk**

Special Advisor

Dr. Kovalchuk is a Professor and Board of Governors Research Chair in Epigenetics at the University of Lethbridge. He is an expert in plant biotechnology, with focus on medicinal plants such as cannabis and poppy, breeding, epigenetics, epigenomics, bioinformatics, genetic engineering and next generation sequencing (NGS) applications. Since 2001, Dr. Igor Kovalchuk has led a research group, working in various areas of plant biotechnology and genetic engineering. He has published over 150 peer-reviewed articles, numerous books and abstracts and obtained 10 patents.

He was instrumental in breeding a special variety of medicinal poppy – thebaine poppy for which he has received an ASTech Award for the Innovation in Agricultural Sciences.

In 2015, Dr. Kovalchuk together with his business partner Dr. Darryl Hudson, started two other companies, InPlanta Biotechnology and Pathway Rx focusing on cannabis breeding and personalized medical cannabis approach, respectively. Since that time, InPlanta Biotechnology became a leader in breeding cannabis, creating hundreds of new cannabis hybrids and developed multiple innovative techniques for genomics-assisted cannabis breeding. InPlanta holds hemp breeding license and is currently registering several new hemp varieties.



**Prof. David Scheider**

Director of Bio-Informatics

Dave Schneider is a broadly trained computational scientist with extensive experience in developing mathematical, statistical and computational models of complex phenomena arising in physics, chemistry, engineering and biology. After pursuing degrees in biochemistry and chemical physics, he switched fields to computer science with positions at IBM, the Centre for Supercomputing Research and Development at the University of Illinois at Urbana- Champaign, the Theory Centre at Cornell University, and the US Department of Agriculture. He is currently a professor at the University of Saskatchewan where his research focuses on bioinformatics, tomography and model-driven data science.



# Recognised Need

*“The advances in agricultural science, and the future of food is tied to our ability to replicate food supply through advances in genetic reproduction, which have increased yields while reducing loss due to crop failures.*

*A necessary ingredient is the need for stable genetics which can be produced at very high throughput. This is lacking in cannabis currently. There is a strong need for Canada to make investments in a vertically integrated science-based approach towards the cultivation of Cannabis if we are as a nation to take advantage of being on the front end of a global push to legalization.*

*Advanced scientific methodology needs to be applied to breeding new elite varieties with stable and consistently reproducible traits matching to specific growth conditions, nutrients and light regimes. Innovative approaches to breeding and cultivation will allow Canadian researchers and producers to bring high-end products to market, create intellectual property, and expand globally at a pace ahead of other nations.”*

**Lorne Babiuk - Professor of Agriculture, Life & Environmental Sciences.  
Past Vice President Research University of Alberta**

