Shaping the Future of Plant Breeding

A public breeders' perspective

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CROP DEVELOPMENT CENTRE
USASK

CSGA Canadian Seed Growers' Association
ACPS Association canadienne des producteurs de semences

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Every $1 invested returns $21 to farmers

Benefit–Cost Ratio: 21.3x

Estimated return on investment for Canadian farmers through producer-funded wheat breeding research at the CDC.**

Internal Rate of Return	Benefit-Cost Ratio	Net Benefits
35.6%	21.3	$2.4B

$3.4B
additional gross wheat farm output from 1995-2024 as a result of producer-funded CDC wheat breeding

76
CDC varieties released across bread wheat and durum since 1995

37%
of harvestable durum acres in Western Canada seeded with CDC varieties, in 2024

Plant Breeding is a Continuum

1: Foundational Science	2: Germplasm Enhancement	3: Variety Development	4: Pre-Market Evaluation	5: Commmercialization
•Generating knowledge and tools to be used in germplasm enhancement	•Applying foundational science to develop and characterize germplasm	•Refining and developing commercially ready varieties	•Adaptation testing of lines for registration and commercialization	•Commercial activities related to seed production/plant multiplication.
Adequate	Some Gaps	CRITICAL GAPS	CRITICAL GAPS	Some Gaps

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Elements of Success

Deliver Superior Field-Ready Varieties

Provide choice and support the market while meeting meeting the diverse needs of **end-use customers**. **customers**.

Technology Driven Innovation

Integrate advanced **breeding technologies**, screening screening methods, and data science for efficient delivery.

Leverages Farmer Investments

Recognizes and strategically builds upon the **long-term long-term investments** made by farmers.

Enables Competition & Collaboration

Foster partnerships that drive **innovation** and expand expand choice within the agricultural ecosystem.

Provides Stable Long-Term Investment

Secure reliable **public and private funding** for sustained program growth and research.

Enables a Return on Investment

Maintain the capacity to deliver a **sustainable ROI** for all stakeholders involved.

Attracts Investment & Talent

Draw domestic and global **expertise and capital** into the Canadian plant breeding system.

Connected Across the Continuum

Strong **feedback loops** focused on delivering measurable, practical results for modern farmers.

Supportive Regulatory System

A responsive **commercialization framework** tailored to the needs of farmers and end users.

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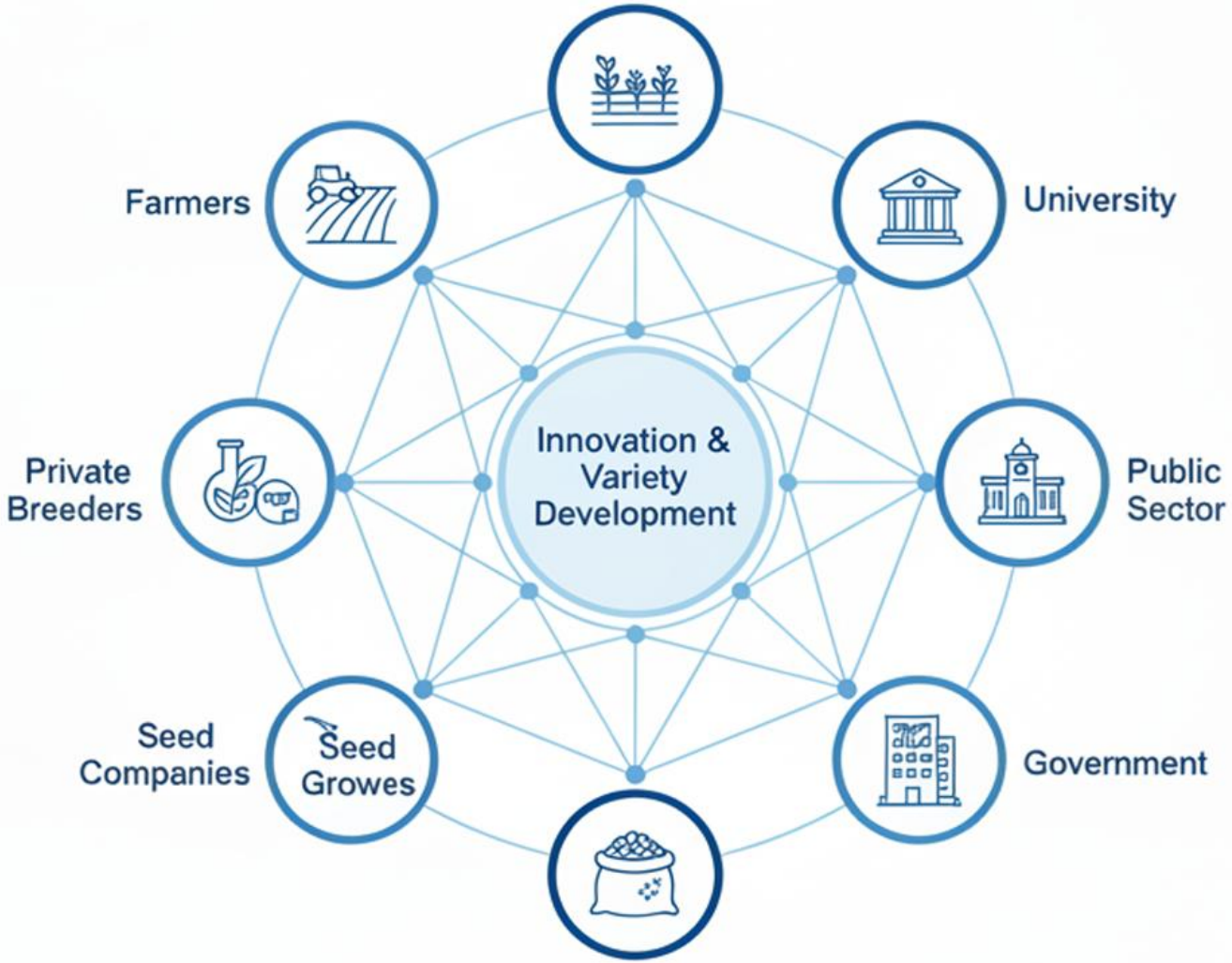
A Complex Ecosystem



A "Made in Canada solution"

Superior varieties, not more varieties

Collaboration and competition

Entice new breeders

Value along the continuum

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My Vision of the future

NO SINGLE ACTOR CAN DELIVER OPTIMAL BREEDING ALONE

High-tech (genomics, data, digital tools)

System-based (ecosystem players and funding structures)

Efficient and fast (greater returns, quicker cycles)

Sustainability-oriented (supporting environmental and economic goals)

Publicly anchored
(for stability and long-term gains)

Privately enhanced
(for efficiency and delivery)

Farmer-supported
(for funding, direction and relevance)

BALANCED SYSTEM: PUBLIC + PRIVATE + FARMERS

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Public Breeding as the Anchor

Private vs. Public vs. Co-operatives : Complementary roles

Public programs supports **crops, regions, and long-term trait priorities** that ensure broad public benefit

They should take **Risks** that may bring significant **reward**

Independent strategies are not **redundant, boom (in)** and **bust (out)**

Strong training: modern tools, **real-world** breeding **experience** and **connections** to farmers and industry (Plant breeding is not research *per se*)

Public plant breeding fills gaps and produces socially valuable outcomes that markets alone may not deliver.

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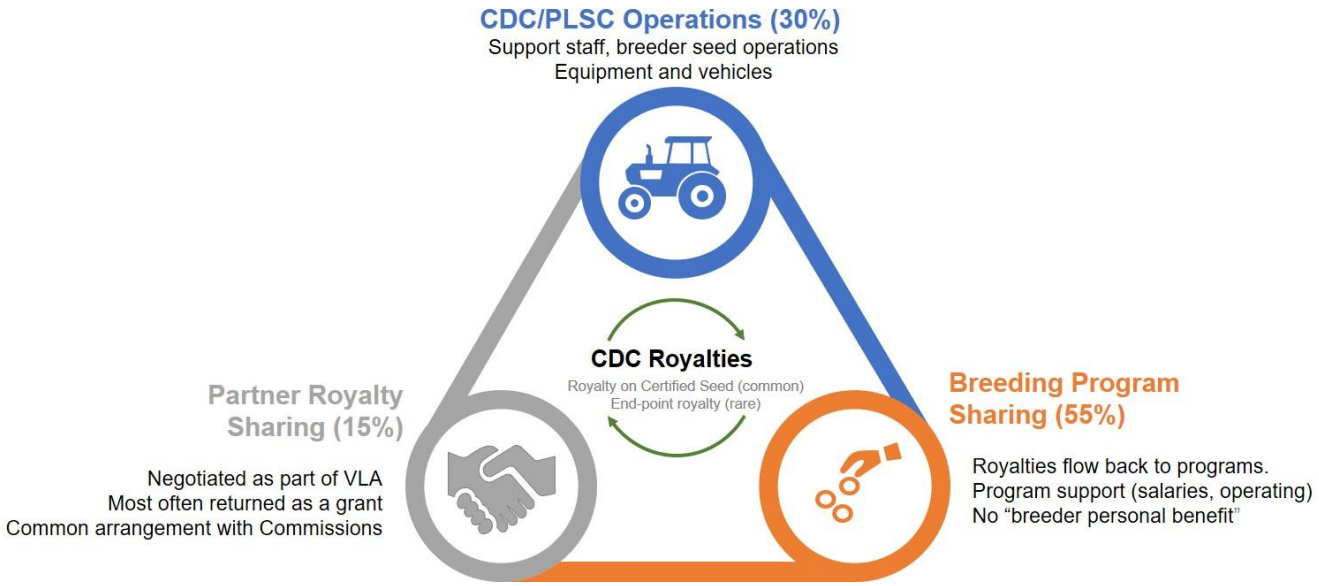
A Stable Environment

Start-stop funding, short term funding is the **enemy** of plant breeding

In and out, avoid **monopolies** at all levels (IP, breeding, commercialization)

Programs vs. **Projects**

Self-competing models should be avoided



Regulatory framework to support **science-based** innovation

ROI - Right balance between **reward** and **return**

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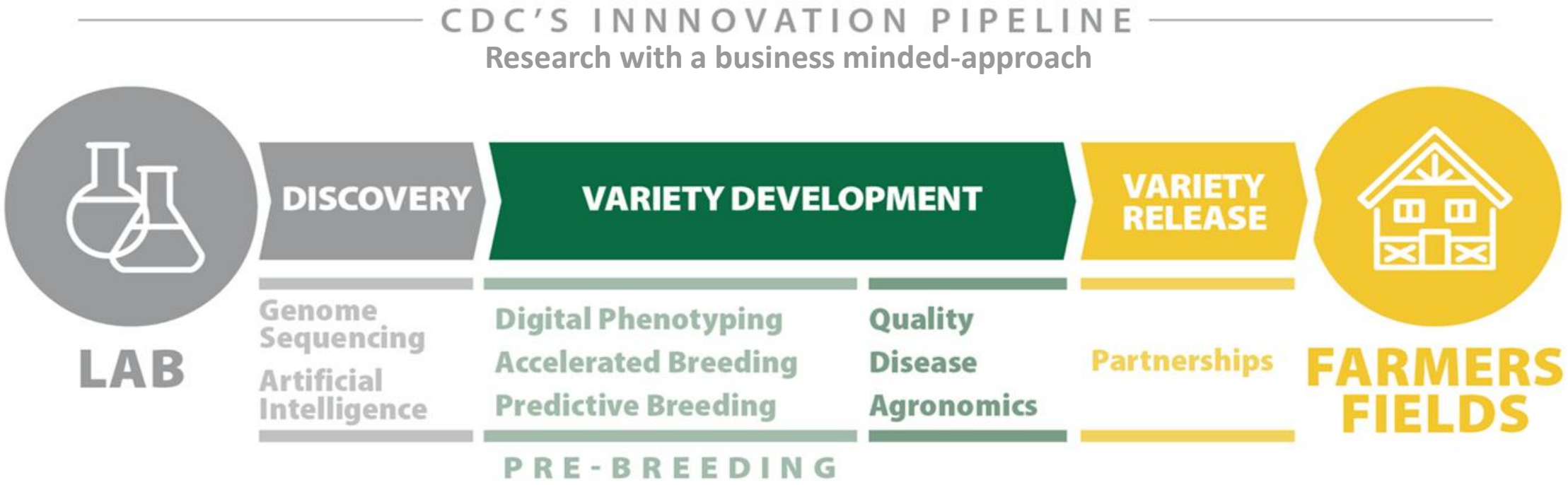
The Vision of the CDC



The CDC operates **one continuous crop development system**. Scientists, students, breeders, and partners work within a **tightly connected pipeline** designed to move ideas forward **efficiently and responsibly.**

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Thank You

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