The Future Governance of Crop Research in Western Canada

Richard Gray
University of Saskatchewan

CAIRN
AN ERCA RESEARCH NETWORK

Many Drivers of Change for Crop research in Western Canada

- End of CWB
  - New marketing/logistics/ pricing system
  - CIGI/WGRF levies
- Establishment of new cereal commissions
- Stronger plant breeders rights – UPOV 1991
- December 2013 statement that AAFC was getting out of finishing varieties – (recently reversed)

How is Crop research going to governed in the future?

- Status quo? – mainly public with producer support
- Like Canola? - large MNE breeders, gov't upstream, producer – agronomics
- Like Pulses? – producer funded and controlled breeding, public support – little private
- Other models?

Ongoing processes

- CSTA
- Prairie Cereal commissions organizations
  - Models for producer voice/ control in variety development

B/C Ratios of Canadian Ag Research- Recent Studies

Study	B/C
WGRF - wheat	36:1
Zero Tillage	52:1
Regional Variety Trials	63:1
Sask Pulse Growers	20:1

The Underfunding of Research is Problem #1

- High B/C ratios indicate many lost opportunities for Canada
- Research can increase economic growth while addressing food security
- How can we increase investment?

Who can pay for additional research?

- Governments (Taxpayers)
- Producers and Consumers through check offs (Levies)
- Private industry from the sale of crop inputs, machinery and technologies

3 Types of Knowledge Inputs for Innovation

Public Goods (non-excludable)	Industry Goods (non-excludable)	Private Goods (excludable)
Basic Science Research	Crop genomics, germplasm, unprotected varieties	IP Protected crop varieties/traits/processes
Science literacy/ ecology /chemistry/ biology	Agronomy/ best management practices	Protected production process
Business management	knowledge dissemination product, input testing	Patentable mechanical innovations
Human and model crop Genomics	Crop disease research, biological control systems	Chemical Pesticides Inoculants
Pathogen Research	Quality standards/systems Market access	product and market development

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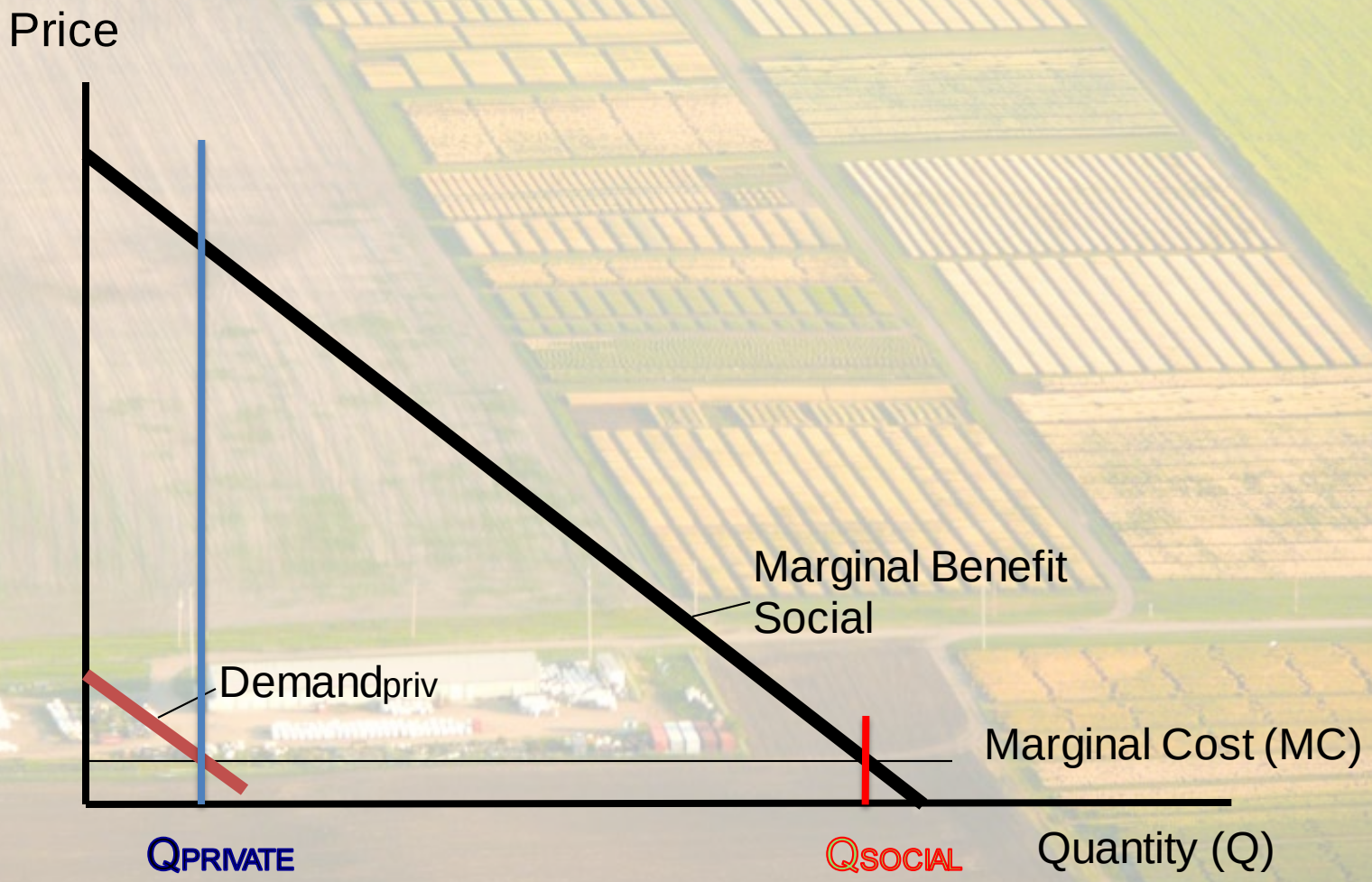
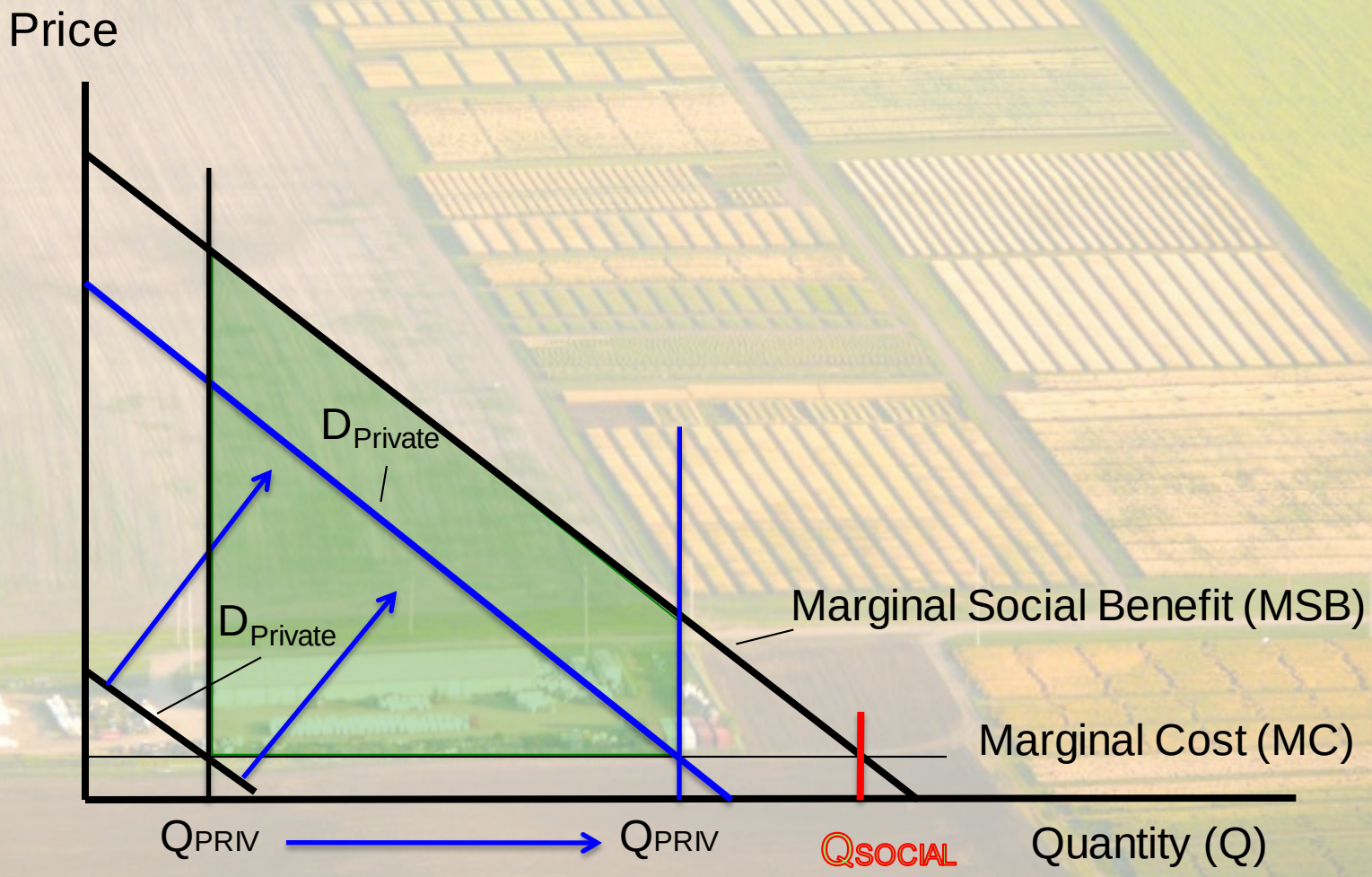
Why not Private Breeding?

Weak IPRs and Private Demand for Research



IPR Impact on Private RD&E



Natural Monopolies

- Because knowledge can be used again and again without depletion it is most efficiently produced only once… creating the conditions for a natural monopoly
- More firms increase competition but duplication of effort increases cost
- a very small number of firms-- this is efficient from a knowledge production perspective but the lack of competition gives the firms market power and the ability to earn rents
- Typically about 10% of these rents get reinvested in research for corn, canola and soybeans

The Agricultural Growth Act passed February 2015

1. Makes Canada consistent with the UPOV 1991
2. Breeder's rights are extended to essentially Derived varieties
3. 20 versus 18 years of protection
4. Expanded rights to include; reproduction, conditioning for propagation, exporting, importing, and stocking….(more points of Enforcement)
5. Rights over harvested material of unauthorized use of propagating material

Rights extending to Harvested Material

- 5.1 …plant breeder's rights … (extend to)… any **harvested material**, including whole plants or parts of plants, that is obtained through the **unauthorized use** of propagating material….
- This clause makes seed purchase agreements legally enforceable →If authorized seed users must sign an agreement to pay EPRs then unauthorized seed users can be forced to pay via this clause… (farmers can save seed but must pay if required)
- However, a whole system might be needed to make enforcement for a breeder feasible

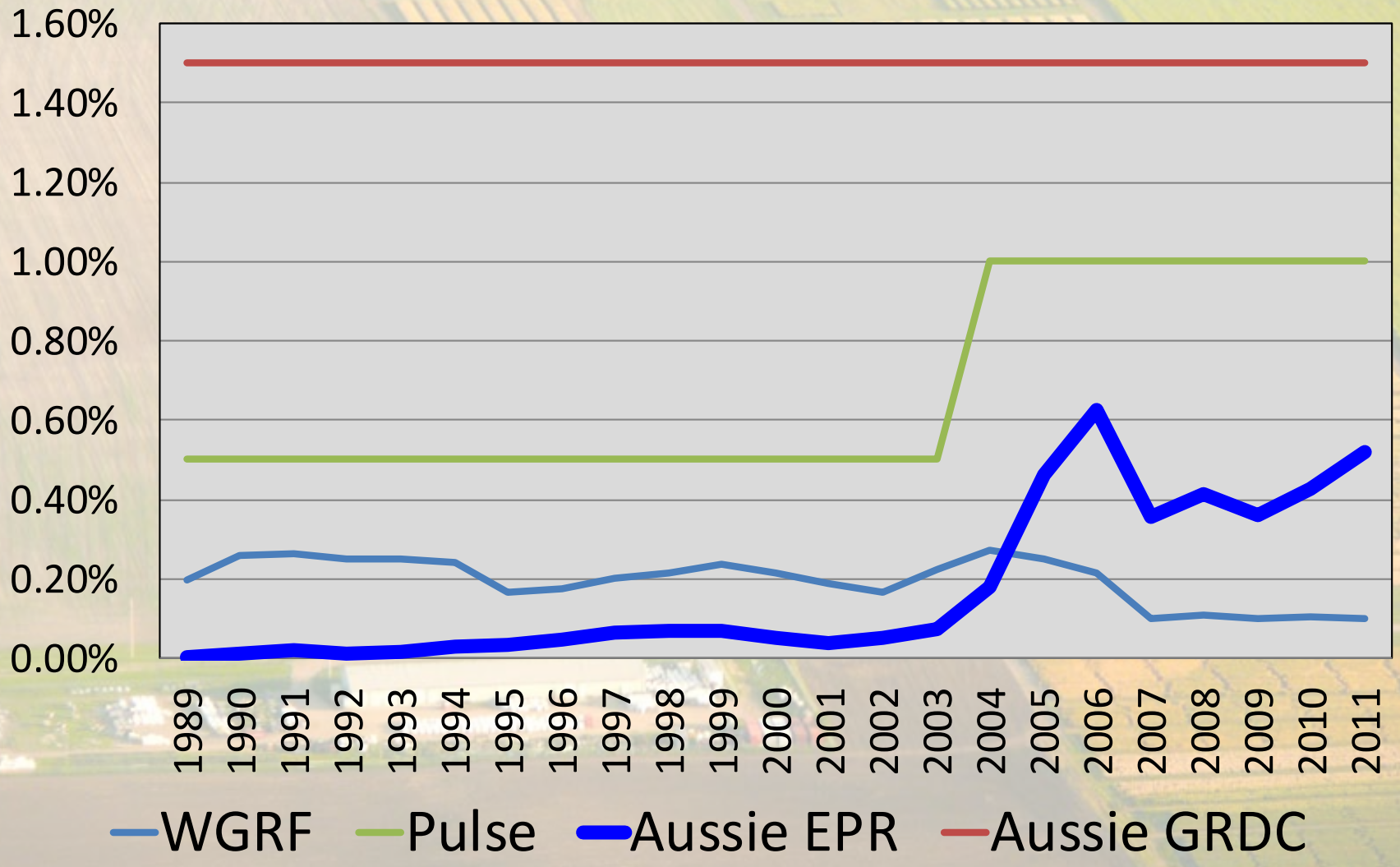
EPRs and Regulation

- A general EPR system including collection could be created through regulations
- The Minister (cabinet) could create an system if the industry wants it
- What is the best system for Canada? What is the international experience?

Why not Aussie Style EPRs?

- High transactions costs for collection – needs a coordinated system like SeedVice in Australia
- Slow to generate $ - It took 15 years -1994 – 2008 to reach .5% average EPR
- Perhaps too much power in the long run
  - Costly
  - Low re-investment rate?
  - innovative in long-term (corn √ versus Canola ?)

EPRs and Levies % of Gross Income 1989-2011



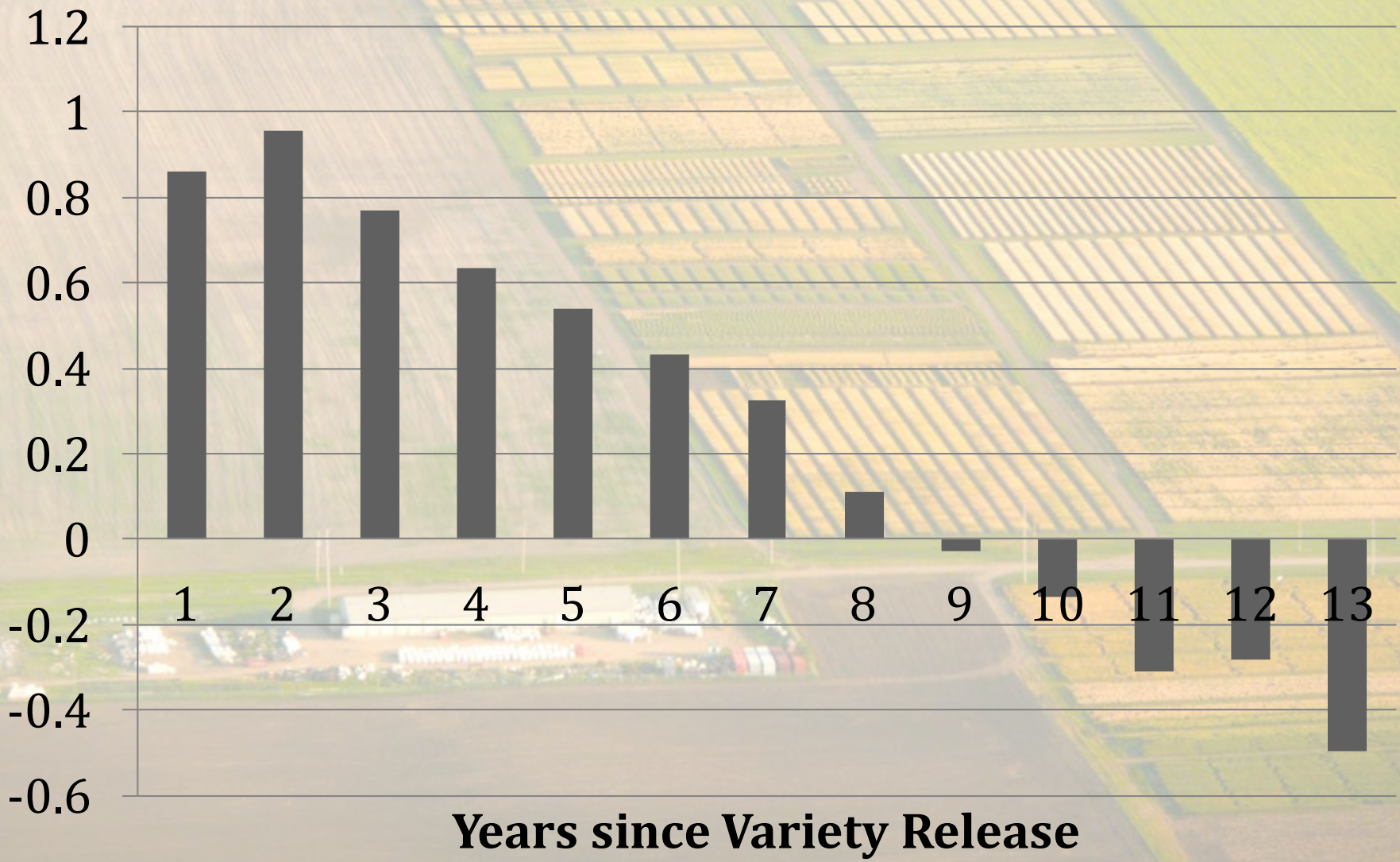
EPRs (CVOs) in France

- Uniform rate of .7 Euro per tonne
- the EPR rate is negotiated between national farm organisation and the seed association

Why this system?

1. They start to generate revenue quickly
2. They are easier to administer because one ERP rate is deducted at sale and there is no incentive for farmers to mis-declare varieties
3. Accelerated adoption of best varieties
4. Controlled costs for producers – 1% plus seed royalties

The Change in Average Adoption (Uniform – Actual) Bolek-2015



The Case for Levy Driven Research- Theory

- Alignment of incentives- the incidence tax and benefits are similar
- voice given to those making the investment and those familiar with the industry
  - Ronald Coase made this argument about lighthouses i.e. Trinity House- voice and incentive alignment
- But voluntary levies will have a free rider problem

The case for levy driven research- Practice

- 1980s onward many research levies (50+) established within the Fed –Prov. Agri-product Marketing Legislation
- Generally established at a provincial level
- In Sask. Development Commissions have refundable levies. Wheat, oats, barley, canary seed, mustard, Canola, flax.
- Development Boards have compulsory non refundable levies – Sask Pulse is the only board in Sask.

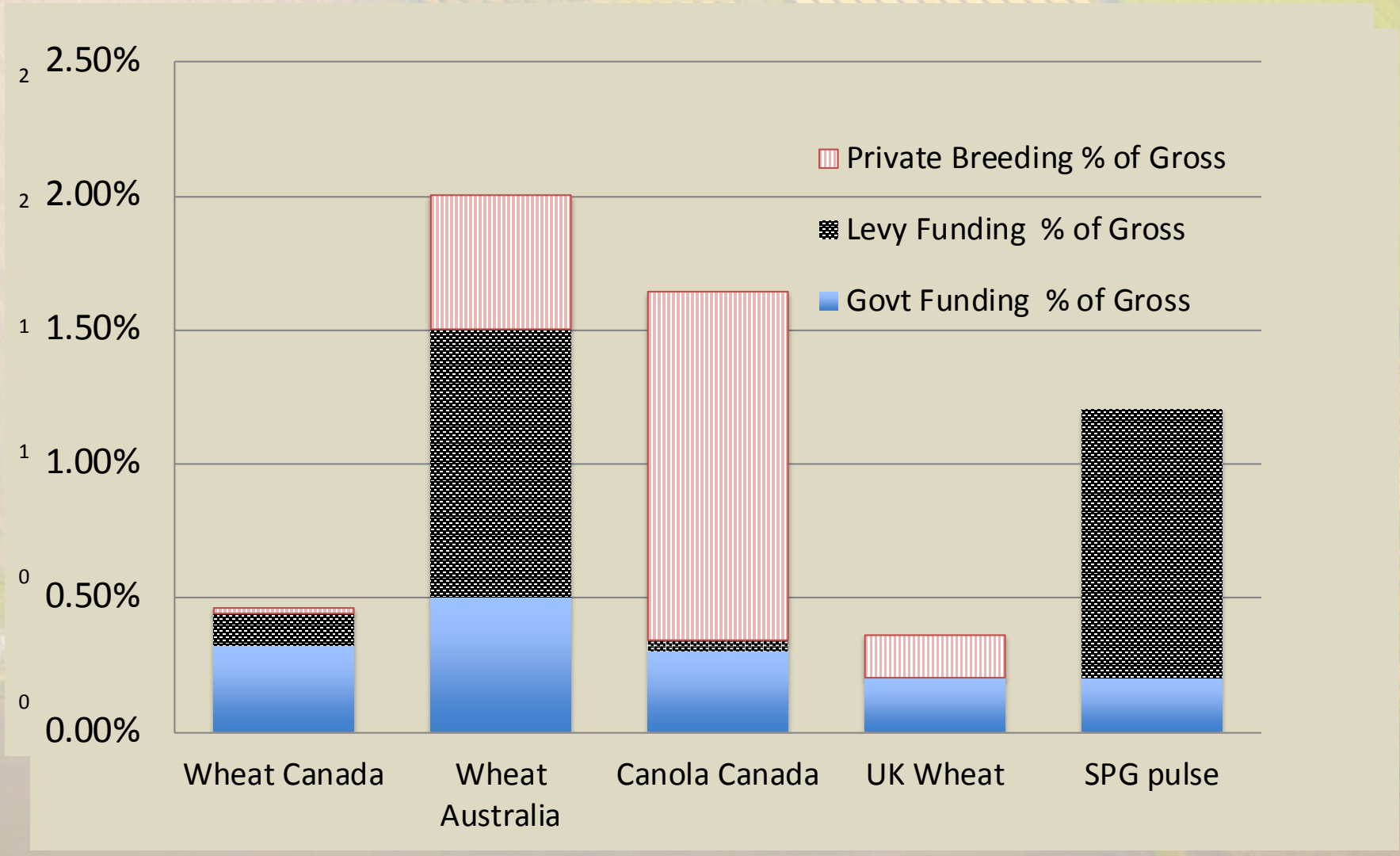
The case for levy driven research- Practice

- These have been effective structures to identify research priorities to move the industry forward
- The Sask Pulse Development Board increased levy from .5% to 1% in 2004. They are dominant and very successful
- As predicted by Theory commissions operate at very low levy rates- could be avoiding the free rider problem

- POST SD CWB – 5 YEAR WGRF
- Provincial wheat and barley commissions in Western Canada $1/t (total with WGRF/CIGI) refundable

The Need for Partnerships

Approximate Crop Research Intensity of Gross Selected Crops 2010



A balanced "4P" approach is needed

- 4P is Private-Producer-Public Partnerships
- This balanced approach is required for:
  - Greater overall funding
  - Spanning the full complement of research to provide *industry goods* and *public goods* while tapping into global intellectual property owned by the *private* firms

Creating a Complete System

- Start with $ for varieties – this is the missing part
- Provide some systematic access to germplasm in return for access to other IP
- Continue to provide public good research
- Provide industry goods – including agronomic and germplasm development/variety testing
- Work together through 4P -

  public-producer-private partnerships

Ideal Future

- Establish 1% EPR across the board paid to all variety owners – enough rents to create demand pull
- Could fund a privatized AAFC
  - As one Crown Corp – like Agri-Obtentions
  - AAFC could have a variety sharing program for new entrants/partners
- Producer voice/control
  - Producers can use their own resources to make sure there is supply of good varieties

Where we could end up without action:

- Reduced public investment
- Small underfunded private breeding
- Producers involved everywhere with too few resources to be globally competitive

The Challenge for policy makers is to think Big and Act

- We won't get many chances to create a research system
- It needs to be research intensive or we cannot capture the benefits from research
- Doing nothing is doable and affordable but will limit Crop research for decades to come

Thank you