

CAIRN POLICY BRIEF

CANADIAN AGRICULTURAL INNOVATION AND REGULATION NETWORK

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SOME INTERNATIONAL SUCCESSSES IN FUNDING CROP RESEARCH FOR IMPLEMENTATION IN CANADA

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Issue

Higher grain prices, declining rates of agricultural productivity growth, and high rates of return to crop research, create the need for producers, the grain industry and governments in Canada to find policies that will increase the amount invested in the crop research, especially in non-hybrid crops, where private investment has been limited. The lack of funding especially pronounced in wheat, which is a large crop in Canada that has lost profitability and market share relative to other crops.

The Australia crop research funding system has undergone a profound transformation over the past twenty years. The creation of levy based Grain Research Development Corporation (GRDC) and end point royalties (EPRs) created the foundation for a significant

additional industry led investment in wheat pre-breeding and breeding activities, including recent partnerships with multinational firms in the wheat breeding industry. France also has a particularly interesting model for the collection of EPRs. These models hold some promise increasing research funding.

The issue is whether the best features of EPRs and the Australian levy based funding system could be implemented to accelerate wheat innovation in Canada? What are some plausible options, and what implementation barriers are they likely to face?

Policy Implications and Conclusions

A review of the Australian Funding model and the French

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EPRs suggest that these models have been successful funding mechanisms and that with the appropriate policies the best features of these systems could be implemented in Canada. Given the high returns to crop research the ability to invest more in crop research with lead to productivity improvement, and improved bottom lines for the whole industry. However, the breadth of these changes and their widespread impacts, suggests that change will likely only occur after a well understood and agreed to course of action is broadly supported by producers, industry and governments. Without a virtual consensus for change, there is very little potential to resolve the underfunding crisis for these crops.

Statutory levy funded Research Development Corporations in Australia

The creation of statutory levy funded Research Development Corporations (RDCs) which began in 1990, have had a profound affect on the Australian agricultural research system. The RDCs and particularly the Grain Research Development Corporation (GRDC) play a

pivotal role in a better funded and better coordinated agricultural innovation system. The RDCs have given a much greater voice to industry at the national level. The GRDC was instrumental in the creation of market-oriented firms for the commercialization of wheat breeding. The result is cereal innovation systems an investment of over \$20 million per year in pre-breeding research and \$60 Million in cereal breeding activity, which is about 4 times current Canadian expenditure levels. As end point royalties increase over time this level of investment could grow considerably.

The creation of the RDC system also had two apparent shortcomings: The funding system failed to maintain a State level commitment to research investment and it created duplication of effort because of the incentives in competitive grant structure. The recent National Primary Industries Research, Development and Extension (RD&E) Framework which facilitates cooperation and the development of national industry innovation strategies, was a needed to improvement

to the Kerin plan although it is still too early to tell how well the strategic plan within this framework can be operationalised.

The RDC Strengths:

- Greater research funding;
- Greater industry voice;
- Corporate governance structure for commercialization/ procurement;
- Greater national coordination;
- Enhanced capacity to work with the private sector.

RDC Weaknesses:

- Free riding by States seems to be an issue;
- National funding resulted inter- State competition and a duplication of effort.

End Point Royalties (EPRs) in Australia

The EPR system in Australia is just now getting to the point of generating sufficient revenue to support a small private breeding industry. As new varieties with higher rates are released over time, EPRs could become a very significant source of breeding revenue. This prospect allowed the GRDC, State Governments, universities and private firms to create joint

ventures for wheat breeding with the prospect returning dividends. As such the EPRs have been an essential component the wheat research funding transformation.

Looking forward, the profit motive of the wheat breeding companies combined with steady improvement wheat varieties, suggests a potential for very high EPRs. This could come at a significant cost to producers, similar to what has occurred after an extended time in the hybrid seed industries.

The original Australian 1994 PBR Act was amended in December, 2002 to clarify the Act and improve enforcement. In Western Australia, the use of a very deliberate implementation strategy by DAFWA has resulted in an EPR system with a high degree industry support and compliance. Nationally, the success of EPR enforcement has be far from universal. A recent review by the Australian Council for Intellectual Property (2011) found the there were still many outstanding issues in the enforcement of EPRs and made a set of twenty-two recommendations to

government. Given the essential role of EPRs in funding private breeding activities, it is important to create legislation that has low transactions costs and high compliance rates. It is apparent from the extent of recommended changes in ACIP that many improvements are still needed in the Australian EPRs system to fully capture the value of this policy instrument to fund agricultural research. In Canada, a lot can be learned from the fifteen years of Australian experience to amend the Canadian PBR Act 1990 to bring it into compliance with UPOV 91 to create workable institutions for the collection and enforcement EPRs in Canada.

The current PBR/ EPR Strengths:

- When enforceable EPRs can provide private research revenue;
- Financial reward is based on research output;
- Can be compatible with lower cost farmer saved seed;
- Can attract international partners with IP, and;
- Bag licenses and contracts can work with marketer agreements even without UPOV 91.

The current PBR/EPR Weaknesses:

- Enforcement for small companies with many growers can be difficult and prohibitively expensive if done through the courts.
- Rapid, inexpensive and comprehensive means of variety identification does not yet exist making inadvertent or intentional variety mis-declaration difficult to deter.
- Mis-declaration incentives for farmers will increase with rates increases and greater differences.
- Transactions costs for breeders, farmers, marketers, users can be high.

EPR rates will increase overtime and could become excessive with market concentration and inadequate incentives or gateways for new firm entry.

End Point Royalties in France

The wheat royalty system came into operation in 2002, following a long period of discussion between farmers, breeders and the government. Based on a signed agreement

between the leadership of seed industry and farm organizations, the government passed Law 28 in July 2001, which put the system into effect. A 0.5 Euro per ton levy applies to the harvested milling wheat product and is collected at first point of sale. The levy is collected by the grain handling companies at the time of delivery. Most of the collected levies (85%) are submitted to a property rights management system for plant breeders, which in turn allocates the end point royalties to breeders in proportion to their varieties' share of wheat deliveries. The remaining 15% is used to support public wheat research.

The wheat EPR royalty system in France is unique and has overcome some of difficulties inherent in the Australian approach:

- It is simple to administer and requires few transactions and very little transaction costs for any party.
- The statutory requirement for all wheat buyers to deduct the levy eliminates most enforcement issues.
- The uniform rate applied across varieties eliminates

any incentives for the producers to mis-declare varieties.

- A uniform royalty rate accelerates the adoption of traits with exceptional value.
- A uniform royalty rate accelerates put existing varieties, on an equal revenue footing with comparable new varieties.
- The EPR rate negotiated between the seed industry and the farm leaders every 5 years eliminates the ability of the concentrated industry to charge excessive royalty rates.

This system is not without its limitations:

- The EPR rates are very low (although greater than the WGRF refundable levy rates) and therefore may provide inadequate incentives for private research.
- The uniform levy rate, may provide less than adequate compensation for niche varietal development

Although the French EPR system has some shortfalls the truthful or informed variety

declaration is an obstacle to enforcement in Australia. This issue could also be critical in Canada, where at this point in time, producers are only required to declare the class of wheat delivered. The French system has the advantage of low transaction costs for the breeders would allow new players to enter the industry on a small scale, and maintain competition in the system.

Options to Enhance Research Funding in Canada

Three options composed from the desirable features from the Australian and French research funding were chosen as potential policies for implementation in Canada. The particular options were chosen to illustrate that these desirable features could be employed in a number of ways to improve research funding in Canada. While each option has its strengths, each has issues that would need to be addressed in the successful implementation strategy.

Option 1: Statutory levy funded Grain Research Development Corporation (GRDC)

This option would be similar to Australian RDC model (the

PIERD Act) without end point royalties. A statutory levy on farm gate sales, matched by federal and provincial governments would fund RDCs. The “GRDC” would be managed by producer elected board of directors. A national strategic framework agreement would be established, to ensure greater coordination of national provincial and university research activities. To ensure an increase in the level of funding, these levy rates would be set at 1% matched by .6% federal government and .4% provincial government.

The creation of statutory levy would significantly increase research funding while creating a strong vehicle for industry leadership into the development of national strategy. This would enable the industry to drive innovation in the short term while having the resources and the ability to shape innovation institutions for the long term. The higher investment levels combined with more efficient delivery would significantly increase innovation capacity and productivity of the sector. The attractiveness of this model might entice widespread producer support across many

commodities, in which case it could become a more general strategy for agricultural innovation. This option could also be a natural stepping stone for either option 2 or 3.

Option 2: Introduction of Australian-like End Point Royalties

This option involves the introduction of Australian-like EPRs supported by an amended Plant Breeder Rights Act. This option would extend plant breeders rights to the purchase and marketing of harvested material and would create a significant revenue stream for breeders. This would enhance the revenue stream for existing breeders and could additional attract research investment.

The advantage of option 2 is that it will require very little new public resources, However, as with the Australian system, the enforcement of rights for grain fed on farm or bartered with neighbours would continue to be problematic particularly for funding feed grain varieties.

This option could attract private investment into the wheat sector. It may be attractive to WGRF and other producer breeding

organizations as a source of additional revenue. However, it would not be as attractive to MNE investors as the Australian situation, unless existing public organizations were willing to grant greater access to their germplasm and/or withdraw from breeding activities.

Option 3: Statutory levy funded EPRs and Grain Research Development Corporation

Option 3 is the most complex option discussed, and combines a statutory levy funded GRDC combined with a uniform statutory EPR. In this option a single statutory levy would be used to fund both an RDC and fixed rate EPR paid to variety owners. This approach would increase the research funding base to do pre-breeding, while creating a strong demand pull financial incentive for breeding firms and institutions to create high performance varieties adopted by producers. The levy rate and the amount paid for EPRs would be reviewed every five years, with rate changes proposed the GRDC and approved by government.

This combined approach has all of the advantages of the RDC model, the French EPR

system, plus the efficiency in revenue collection gained by having a single statutory body also collect the EPR. The use of a single collection system would avoid many of the enforcement issues with end point royalties, it would not create incentives to mis-declare varieties, and it would have very low transactions costs, for breeders, marketers and producers. The ability to extend EPR collection to all grain sales would also put feed crops on an more equal footing with other crops in terms of private incentives.

This option would have the largest impact on innovation. The RDC would give producers a very large stake in the sector. Unlike market based EPRs, which have to compete with existing royalty free varieties for at least the first decade, (and therefore increase slowly over time), in this system the EPRs would start out at significant level and would initially create much more revenue generation. This ability to more quickly generate cash flow would not only provide capital for incumbent firms but it would increase the incentives for

firms with elite germplasm to enter the industry.

Implementation Challenges

An alignment of purpose among producers, the larger grain industry, provincial government and the federal government will be required to improve wheat research funding in Canada. This alignment of purpose will not be achieved easily. At a minimum, the following elements are required to implement any of the proposed options.

1. An awareness of producers and their leaders of the high rates of return to additional agricultural research and that levies would be in investment in the future with a high rate of return;
2. An acceptance that production related agricultural research is likely to continue to decrease in the absence of institutional change;
3. A strong push from industry leaders requesting a new research funding

environment;

4. A strong signal and commitment from all levels of government (and opposition members) to fund additional research if the industry agrees to contribute more and politically support the change (i.e. a social contract);
5. The willingness of all parties to compromise to attain system, which is an improvement over the status quo leading to clear understanding by all parties of a common viable path forward;
6. A well-defined implementation strategy with well described outcomes.

While, some of these essential elements already exist in Canada. Other elements will only developed with a sustained communication and policy development process.

There are a many stakeholders that would be impacted by the implementation of any one of these three funding options,

including those individuals and institutions that will benefit from research outcomes, those that fund research, and those that currently undertake, manage and commercialize research. The current levy supported industry groups like WGRF and provincial organizations need to understand their role in the new plans and endorse the change. The private crop research sector needs to see a mechanism for improved commercial viability. All the players need to understand that the sector will continue to shrink in the long term unless research investment takes place.

Moving forward will require a good deal of leadership, with a drive to achieving a better outcome. Currently, there is some awareness of the issues in the agricultural sector as evidenced by the resolution and work of the Canada Grains Council. There is growing support for far greater industry and public investment in research. These ideas and initiatives need to be shared, discussed and developed in the larger agricultural community. Ministers of Agriculture, their departments, and their political rivals need to be proactively

searching for solutions, communicating with the industry and with other governments, to develop a national strategy that will include the industry in decision making processes. The stakes are extremely high because as an opportunity not seized eventually becomes is an opportunity lost. It would be a shame to look back two decades from now and lament about inability to seize such an obvious investment opportunity.

Fortunately, funding agricultural research is not a zero sum game. The high rates of return to agricultural research means that even if the benefits from research do not accrue direct proportion to what each party contributes, the benefits for each party are still likely to dwarf their costs. This should help forge a social contract where producers, industry and taxpayers can benefit from forming a social contract to invest the future of the industry. Clearly, there are viable options to revitalize Canada's wheat research sector. The worst outcome for all parties concerned would be the lack of an agreement to move forward resulting

continued reliance on a shrinking pot of public investment.