Exploring Options for Producer Involvement in Wheat and Barley Variety Development

Executive Summary

Prepared for
Wheat and Barley Variety Working Group

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Value Capture by Producers and Rationale for Producer Involvement

Development of wheat and barley varieties creates significant value for wheat and barley producers in western Canada through improved varieties that increase yield and/or have disease resistance and/or have traits desired by users. A fundamental factor that impacts who in the grains value chain funds variety development is the self-pollinating nature of wheat and barley, which allows producers to seed harvested grain with minimal loss in efficacy in subsequent years. This means that producers capture the value of a new variety for a number of years without having to purchase certified seed. In turn, private sector plant breeders have difficulty capturing enough of the value they created to make large investments into developing new varieties. This feature of wheat and barley results in variety development being an industry or public good, which is why public sector investment accounts for the largest share of overall annual investment for both wheat and barley.

Approximately $56 million is invested annually in wheat and barley variety development, with taxpayers providing 72% of the funding, with producers and the private sector investing the remainder in similar amounts. Producer investments have typically funded specific variety development initiatives at mostly public institutions, such as Agriculture and Agri-Food Canada (AAFC), the University of Saskatchewan (U of S) (also referred to as the Crop Development Centre), the University of Manitoba, (U of M), the University of Alberta (U of A), and the Field Crop Development Centre (FCDC) in Alberta.

Producers have considerable self-interest to ensure that investment in variety development is at least maintained, but more realistically that investment increases to create even more value for the production sector to remain competitive with other crops grown in Canada, and to enhance competitiveness with wheat and barley production worldwide. Based on the proposition that public sector investments into variety development do not increase, there are two general approaches available for increased investments which involve either the private sector or producers. One approach involves producers and increases the amount of annual check-off funds ear-marked for variety development. The other uses a royalty system based on intellectual property rights which attracts additional private sector investment in variety development. These approaches are not mutually exclusive.

Furthermore, there are a variety of ways in which producers can be involved in variety development and producers have a number of reasons to be involved in variety development. This report provides a compelling case for increased producer involvement in wheat and barley variety development. One obvious reason is that producers want some influence over variety development as long as producer dollars through check-off levies are used to fund variety development.

Producers Want to Gain a Better Understanding of Some Issues

Producers are currently involved to achieve desired outcomes that include: (1) wheat and barley being competitive with other crop kinds in western Canada: (2) providing traits desired by producers such as disease resistance, and (3) providing specific quality traits desired by end users. Going forward, the extent of producer involvement can be determined with a better understanding of:

- whether producers need to own and operate a seed company, or whether involvement in variety development is through partnerships and leveraging of funds;
- whether producers should capture royalties on investments producers fund, or whether the payback is through improved varieties for improved on-farm returns;
- whether producers should support an End Point Royalty (EPR) system, or whether variety development should primarily be funded through refundable levies;
- whether a more centralized and coordinated approach is required to have an effective approach to maximize the contribution of producers' provincially based check-off funds that are invested in variety development; and
- whether one approach applies to the cereal sector, or whether crop specific approaches may be required (e.g., for barley: feed, food, or malt uses).

Potential Options for Producer Involvement Models

How producers could be involved in variety development is explored in this report. Producer involvement can range from continuing the current approach where investments are made by provincially based wheat and barley Commissions and the WGRF, to possible options with more coordination and information sharing amongst current organizations, to creation of new organizations and/or partnerships that focus on directing producer funds in a centralized and coordinated manner, and to options where producers have ownership in a plant breeding company.

To assist producers in their exploration and on-going discussion of options for producer involvement, five models for producer involvement are discussed in this report. The potential options selected are:

- Model A - Current Approach with More Coordination and Information Sharing;
- Model B - Eight Provincial Commissions involved in Variety Development Research Programs;
- Model C - One Non-Profit Producer Body: Wheat and Barley West;
- Model D - Australia North: Separate Partnerships for Pre-Breeding and Breeding/Finishing; and,
- Model E - Producer Ownership in a Cereal Breeding Company.

Model A referred to as the "***Current Approach with More Coordination and Information Sharing***" and (Model B) labelled as "***Eight Provincial Commissions Involved in Variety Development Research Programs***" are modifications of the current approach. Both of the options do not involve creation of any new institutions and builds on current processes and ensures that producers are involved, particularly when check-off levy funding continues for variety development. Without an EPR system, the key risk associated with these two models is that sufficient private sector funding may not be attracted into the sector. As well, producers are not positioned well if AAFC decides to devote fewer resources to variety development, such as not finishing varieties. An additional risk with Model B is that administration costs increase and the potential for increased duplication and possibly fewer strategic investments in variety development.

A third option (Model C) which is referred to as "***One Non-Profit Producer Body: Wheat and Barley West*" (WBW**), has a new formal structure between the Commissions, such as a joint venture that focuses on funding high priority variety development projects. This model is a more structured approach than either Models A or B where WBW contracts out research or partners with others on priority variety development projects. WBW can more easily enter into partnerships with public sector institutions and private sector seed companies to foster specific variety development initiatives. The producer's share of royalty payments and license fees collected by any developed partnership would be used to fund additional producer directed variety development projects.

The consultants' view is that model option of WBW is likely more appropriate for producers than either Model A or B. Reasons include centralization through a formal structure and associated lower administration costs, avoidance of potential duplication and redundancies, allowing for larger one-time investments, and enabling more producer influence and leadership. The preference for Model C over Model A and Model B occurs in the case when there is no EPR system and, as well, when EPRs can be collected on newly released varieties. This preference is based on continuation of a meaningful allocation of check-off levies to fund the producers' contribution to variety development. If producer contributions diminish, so does producer voice and influence. There is a strong rationale for higher levels of producer investment in variety development.

A potential risk with Model C is that some governance issues may arise if certain groups representing specific classes or wheat and barley become dominant, which may lead to dissention. As with the above two models, WBW has the risk of not attracting enough producer investment if an EPR system is not in place to incent more private sector investment in variety development.

The current system and its variants of Model A and Model B can easily transition into Model C (WBW), with minimal disruption to variety development efforts in either the public or private sector.

The fourth option (Model D) is a variation of the Australian system, which is referred to as "***Australia North: Separate Partnerships for Pre-Breeding and Breeding/Finishing***", where a producer body such as WBW and AAFC enter into a partnership (or joint venture) which become responsible for all pre-breeding activities (or basic discovery research) in an entity referred to as the Wheat and Barley Variety Development (***WBVD***) Corporation. AAFC assets used for variety development and associated staff become part of WBVD, which are co-funded by producer levies and by the federal government.

Over time, WBVD fosters development of for-profit P4 partnerships (which could include, for example, WBVD, a university breeding facility, and a private sector seed company). The model evolves to a structure where WBVD focuses on industry good projects (such as germplasm development) and the P4 breeding companies efforts are on breeding, finishing and commercialization. The Australian model includes EPRs for a royalty stream based on successful new varieties. Evolving to this option from the current structure may not be easy, requires adoption of an EPR system, and involves some risks during the transition.

One risk with the WBVD option is the potential failure to achieve the desired structures due to the considerable change that is required in overall structures and the transfer of some public assets and employees into WBVD. As well, overall taxpayer funding of variety development could decrease with this option, as federal funding could be limited to the co-funding of WBVD. The emergence of only for-profit breeding companies (via the partnerships) presents a risk that small class crops may be underserved through new varieties.

Our analysis indicates Model C (WBW) is preferred to Model D (Australia North). However, if over time a transition to Model D is desired; Model C is a platform for transitioning to Australia North.

The fifth option (Model E) "***Producer Ownership in a Cereal Breeding Company***" is where all producers have ownership shares in a prairie-wide cereal breeding company (***Seed Corp***). Each producer's levy contribution to the for-profit Seed Corp becomes their shareholding and ownership has producers directly involved in plant breeding. Seed Corp would have its own staff and breeding program, as well as enter into partnerships with other entities, such as AAFC, CDC, FCDC, and private sector companies. A risk with this option is that producer funding of variety development at public institutions may cease, which can reduce the research capacity at universities and other public institutions. Without an EPR system, this option is highly dependent on an increase in producer funding through check-off levies. With an EPR system, Seed Corp is in direct competition with private sector seed companies, with sustainability based on marketplace success.

A risk associated with this option is the loss in overall public investments since all producer funds are directed to Seed Corp and the company may not continue with current investments in variety development research at universities or fund projects in concert with AAFC. Some Commissions may not support Seed Corp as they may view as unacceptable the arrangement where levy funds ear-marked for variety development are forwarded to Seed Corp. As well, a prairie-wide for-profit breeding company may decide to focus only on large acreage varieties, which disadvantages small acreage classes.

Over an intermediate term horizon, we view Model C (WBW) as more appropriate than Model E (Seed Corp) due to some of the risks, and potential disruptions to variety development at public sector institutions. Notwithstanding, over time Model C can serve as a platform for a transformation from WBW to a prairie-wide Seed Corp.

Response to Areas Where Producers Wanted to Gain an Understanding

As noted above, producers want a better understanding in a few areas. Our analysis suggests that producers do not need to own and operate a prairie-wide seed company to achieve desired outcomes. Producers can provide necessary leadership, influence and direction on variety development through partnerships and leveraging of producer funds. Owning a seed company can create more risk for producers without necessarily gaining additional rewards. However, individual producers can continue to participate in start-up and smaller scale seed companies if they wish to seek an ownership position.

The analysis also indicates that producers capture value each year through the release of new varieties and this on-farm value capture is likely higher without an EPR system. With an EPR system, producers (through their investments in variety development initiatives) can also capture value through licensing of technologies and sharing in royalties through appropriate agreements on varieties that producer funding helped develop. EPRs also provide returns to public sector breeding.

An EPR system has a number of benefits, including providing incentives for additional private sector investment in variety development, and the high potential for greater total investment in wheat and barley variety development. The findings suggest that producers should continue with meaningful funding of variety development through a refundable levy system when an EPR system may be in place, since such producer funding enables producers to continue with leadership and direction of variety development. An idea for consideration is to have an ear-marked per tonne of check-off levy for variety development and that a sizeable portion of such value is not refundable. With producer support, an EPR system creates an incentive structure for much larger investments in variety development and will benefit producers – and producer leadership and influence can continue based on on-going levy contributions to variety development, particularly in the pre-breeding stages of variety development, and through selected strategic partnerships on certain initiatives. With an EPR system, mechanism such as licenses and agreements can help to ensure that germplasm and information sharing occurs between plant breeders.

This report suggests that an approach using a formal prairie-wide structure is preferred, such as with Model C (WBW) which allows for scale economies, consolidated producer voice, and larger and/or more focused strategic investments.

A prairie-wide seed company (Model E) entails some risk. As occurs in the private sector, investments are usually made on larger acreage varieties, with less attention paid to smaller classes and cereals for smaller regions with lower realized returns. This suggests that flexibility is required in the approach taken by producers as they become more involved in variety development. Such flexibility can be achieved through Model C (WBW) and as well through Models A and B.

Strategic Choices for Producers

There are two strategic choices facing producers. The first choice is how producers should be involved in variety development, including whether producers need to own assets or contract with institutions that own necessary assets. The options provided on the type of model for producer involvement can assist in the on-going dialogue between producers on the merits of each option, and which one best meets the needs of wheat and barley producers.

The second choice is whether or not to support an EPR system. An EPR will provide additional revenue for producer/public supported breeding programs and will in all probability increase the level of private sector investment into wheat and barley variety development.

An issue for producers is what Model option best serves producer interests with an EPR system. The path to be decided upon by producers rests on the confidence of whether or not producer influence can be maintained with an EPR system and have continued improvement in varieties. An EPR system enables needed private sector investment, and producers can maintain influence by maintaining levy funding of producer directed variety development projects and potentially through producer ownership in a cereal breeding company.

Producer involvement in wheat and barley variety development may evolve over time through more than one of the options described in this report.