GEORGE MORRIS CENTRE

Canada's Independent Agri-Food Think Tank

A TAX INCENTIVE FOR CERTIFIED SEED:

A BROADER ASSESSMENT

Prepared for: Canadian Seed Trade Association

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EXECUTIVE SUMMARY

The purpose of this study was to extend previous research on a tax credit for certified seed use.

The objectives of this project were:

- To establish a base model of taxable income and cropping patterns on commercial grain and oilseed farms upon which to develop the certified seed tax incentive
- To estimate the tax credit required to induce farmers to use certified seed
- To consider the cost to government in terms of forgone tax revenue, over a broader range of seed categories than has been done previously

To meet these objectives, the price spread between certified seed and bin-run seed was estimated for a range of common western and eastern Canadian crops. Given observed cropping patterns and levels of taxable income for representative farms in western and eastern Canada, the additional expense for certified seed implied by the price spreads was estimated and developed into a tax credit. The estimated additional certified seed expenses and tax credits for western and eastern Canada were combined to estimate a single national certified seed tax credit.

The results showed that the certified seed tax credit that equates certified and bin-run seed costs on an after-tax basis is 55%. Alternatively, the incentive can be structured as a deduction on tax liability of just over $15,000 per farm. The annual value of the tax credit is about $520.8 million; the forgone tax payable to government is about $179 million per year. Previous research suggests that the benefits of the tax credit would accrue to a broad range of stakeholders, and that the benefits could be material.

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1.0 Introduction

In 2004, a study was conducted on behalf of Quality Assured Seeds, Inc. to determine how economic incentives could be developed to encourage the use of certified seeds in place of bin-run seeds. This study was subsequently updated in 2006 for Agriculture and Agri-Food Canada. The results of these studies showed that a tax incentive scheme could be devised such that, based only on the relative costs of certified and bin-run seeds and marginal tax rates, grain producers could be made as well off on an after-tax basis using either certified or bin run seed. The specific tax credit scheme proposed was based on the price spread between certified and bin run seed, the quantity of seed used by a representative grain producer, and the producer's marginal tax rate.

The representative commercial grain and oilseed farm was structured based on Statistics Canada data on Saskatchewan grain and oilseed farms with sales of $250,000-$500,000, and from farms with sales exceeding $500,000. In particular, the cost differences between certified and bin-run seed were estimated using a representative Saskatchewan grain farm model developed from Taxfiler and Farm Financial Survey data extracted from the Extraction System of Agricultural Statistics (ESAS), a publication from Statistics Canada. The results on the representative farm showed that a tax credit on certified seed purchases of about 66% would be required to equate after-tax returns using certified and bin-run seed. This compares with a tax credit of 40% on certified seed purchases found in the 2004 study.

However, work to date has failed to consider the cost and effect of a certified seed tax credit on Eastern Canadian crops, and more generally the issue of creating a tax credit program that is generally available across commodities.

1.1 Purpose and Objectives

The purpose of this study is to extend previous research and investigate the costs of a tax credit for certified seed use over a broader range of crops in western and eastern Canada.

The objectives of this project are:

- To establish a model of taxable income and cropping patterns on commercial grain and oilseed farms upon which to test the certified seed tax incentive
- To estimate the tax credit required to induce farmers to use certified seed
- To consider the cost to government in terms of forgone tax revenue, over a broader range of seed categories than has been done previously

1.2 Approach

To meet the objectives listed above, the following approach is employed. First, the price spread between certified seed and bin-run seed is estimated for a range of common western and eastern Canadian crops. Next, given observed cropping patterns and levels of taxable income for representative farms in western and eastern Canada, the additional expense for certified seed implied by the price spreads is estimated. This is then developed into a tax credit proportional to actual certified seed expenses. Finally, the estimated additional certified seed expenses and tax credits for western and eastern Canada are combined into a single tax credit estimate.

1.3 Organization of the Report

This report is organized as follows. Section 2 presents an overview of the seed cost-spread approach and the data on seed cost spreads. Section 3 applies this data in estimating tax credits for a western Canadian representative farm. Section 4 applies the relevant seed cost spread data into a tax credit for an eastern Canadian representative farm. Section 5 incorporates eastern and western results into a single, national tax credit for certified seed. Section 6 concludes the report.

2.0 Certified- Bin-run Seed Price Spreads

In the 2004 and 2006 studies, price spreads between certified and bin-run seeds were estimated by subtracting commodity grain prices from certified seed prices. This study updates these estimates by extending the range of seeds considered, and by considering both eastern and western Canada, and by explicitly incorporating the costs of seed cleaning. Data on certified seed prices was provided by industry sources. These were compared with publicly available commodity price data from Ontario and Saskatchewan under assumed costs of seed cleaning obtained from an Alberta survey of $.40/bushel. The resulting price spread is taken as the certified seed price less the cleaned value of commodity product. The calculated price spread is illustrated in Table 2.1 below. These price spreads are used in conjunction with seeding rates and acreages of crops from representative farm models to determine the total cost difference between bin-run and certified seed, and then to find the level of tax incentive that equates the costs of certified and bin-run seed on an after-tax basis.

Table 2.1 Saskatchewan and Ontario Certified Seed-Bin-Run Seed Price Spreads, 2006

	Certified Seed Prices 2006	**2006 Commodity Prices, including Cleaning**	**Spread**
	($/bu)	*($/bu)*	*($/bu)*
ONTARIO			
Soybeans	25.80	6.46	19.34
Wheat	18.00	4.18	13.82
Alfalfa	150.02	120.02*	30.00
Timothy	74.24	51.97*	22.27
SASKATCHEWAN			
Wheat	8.63	5.31	3.32
Oats	6.00	2.25	3.75
Barley	6.63	3.56	3.07
Peas	10.50	3.46	7.04
Alfalfa	150.02	120.02*	30.00
Timothy	74.24	51.97*	22.27

* Common seed price

3.0 Seed Costs for Western Canadian Farms

The above price differences between certified and bin-run seed were estimated using a representative Saskatchewan grain farm model developed from Taxfiler and Farm Financial Survey data extracted from the Extraction System of Agricultural Statistics (ESAS), a publication from Statistics Canada. To capture a description of a commercial western Canada grain farm, two queries were run in the ESAS database. First, revenue and expense data on Saskatchewan incorporated and unincorporated grain and oilseed farms with more than $500,000 in sales was obtained for the years 2000-2004. The average acreage of wheat, oats, barley, canola, peas and tame hay was also captured in each year for these farms. These were averaged over 2000-2004 to provide a cropping and taxable income profile of these farms. A second query was run in which the above information was also captured for Saskatchewan grain and oilseed farms with sales of $250,000 to $500,000. The results of these queries are presented in Table 3.1.

To present a picture of a representative western Canadian grain and oilseed farm, the results from the queries presented in Table 3.1 were averaged between the two sales categories. The result, summarized in Table 3.2, is a farm representative of commercial grain and oilseed farm with more than $250,000 in sales. The farm averaged $593,992 in sales, had expenses for tax purposes of $539,000, and realized a net farm income for income tax purposes of $54,876.

Given the crop acreages for the representative farm above, the implied seed purchase volume and cost differential between certified and bin-run seed were calculated. To restate the seed cost spreads on a per acre basis, the seeding rates presented in Table 3.3 below were applied. After calculating the spread in $/acre, they were applied to the acreages reported for the representative farm, using barley, wheat, peas and hay (assuming a mix of 75% alfalfa and 25% timothy) as a baseline. As indicated above, the representative farm is 3,835 acres in size, with 583 acres of barley, 1,395 acres of wheat, 500 acres of field peas, 805 acres of canola, 306 acres of oats and 246 acres of tame hay. It is assumed hay is rotated on a three-year basis.

Based on the acreages in Table 3.2 and the seed cost spread in Table 3.3, the total cost difference for the farm between certified and bin-run seed was calculated. It should be noted here that, because almost all canola in western Canada is certified seed and has a Technical Use Agreement associated with it, the option of using bin-run seed is not relevant. Weighting total cost according to acreages of barley, wheat, field peas and tame hay (75% alfalfa and 25% timothy), the total cost premium is just over $24,510 for the farm as a whole. A detailed breakdown of the cost difference is presented in Table 3.4.

Table 3.1 Average Crop Acreages and Taxable Income per Farm, Saskatchewan, by Sales Category

FARMS WITH $250,000 - $500,000 IN SALES						
	2000	**2001**	**2002**	**2003**	**2004**	***Average***
Average acres per farm						
Wheat	916	964	1,008	985	955	*966*
Oats	200	210	271	238	283	*240*
Barley	413	375	432	425	416	*412*
Canola	528	483	544	563	625	*549*
Peas	327	366	387	369	406	*371*
Tame Hay	182	175	188	194	237	*195*
Net Taxable Income/Farm	21,309	33,577	41,427	28,151	20,263	*28,946*
# of Farms	2,975	3,480	3,155	3,255	3,200	*3,213*
FARMS WITH $500,000 PLUS IN SALES						
	2000	**2001**	**2002**	**2003**	**2004**	***Average***
Average acres per farm						
Wheat	1,808	1,854	1,870	1,796	1,793	*1,824*
Oats	363	414	351	382	347	*371*
Barley	813	688	756	742	773	*754*
Canola	1,011	954	1,022	1,122	1,193	*1,061*
Peas	575	618	644	656	655	*630*
Tame Hay	276	295	273	305	330	*296*
Net Taxable Income/Farm	60,435	94,913	113,366	82,563	52,755	*80,806*
# of Farms	740	920	1,050	1,055	1,105	*974*

Table 3.2 Structure of Representative Western Canadian Grain and Oilseed Farm

Wheat (acres)	1,395
Oats (acres)	306
Barley (acres)	583
Canola (acres)	805
Peas (acres)	500
Tame Hay (acres)	246
Total (acres)	3,835
Average Taxable Income ($)	593,992
Average Taxable Expenses ($)	539,116
Average Net Taxable Income ($)	54,876

Table 3.3 Certified Seed- Bin-run Seed Spreads and Seeding Rates for Western Canada

	Spread	**Seeding Rate**	**Spread**
	$/bu	*bu/acre*	*$/acre*
Wheat	2.92	1.84	5.35
Oats	3.35	2.73	9.14
Barley	2.67	2.62	6.98
Peas	6.64	3.00	19.91
Alfalfa	30.00	0.10	3.12
Timothy	22.27	0.04	0.99

Table 3.4 Farm Level Impact of Seed Price Spread for Western Canada

	Total Seeded Acreage	**Spread $/acre**	**Certified Seed Price Premium ($)**	**Sum of premium of certified seed ($)**
Wheat	1,395	5.35	7,465.77	
Oats	306	9.14	2,796.95	
Barley	583	6.98	4,073.15	
Peas	500	19.91	9,962.32	
Alfalfa*	82	3.12	191.81	
Timothy*	82	0.99	20.27	
				24,510

* Assumes one third of hay acreage base is replanted each year

In order to calculate the tax credit required to make a farm with the financial characteristics of the representative grain and oilseed farm in Saskatchewan equally well off using bin-run or certified seed on an after-tax basis, the total impact of higher certified seed cost must also be

calculated. This tax credit is proportional to the certified seed cost disadvantage according to the following formula:

$$\frac{(1-\text{Marginal Tax Rate}) \times \text{Cost Disadvantage}}{\text{Marginal Tax Rate}}$$

Tables 3.5 and 3.6 present the personal and corporate income tax rates for Saskatchewan. With a net cash income of $54,876, the Saskatchewan farm has a personal marginal tax rate of 35%. The required tax savings is calculated as:

$$\frac{(1 - 0.35)(24{,}510)}{0.35}$$
$$= \$45{,}519$$

Thus, a taxable expense of $45,519 for certified seed use is sufficient to make the representative farm indifferent (on an after tax basis) between using certified and bin-run seed.

Table 3.5 Personal Income Tax Rates in Saskatchewan, 2006

Provincial		**Federal**	
	%		%
first $37,579	11	first $36,378	15.25
On next $69,787 ($37,580-$107,367)	13	next $36,377 ($36,379 - $72756)	22
On remainder ($107,368 and over)	15	on next $45,528 ($72,757 - $118,285)	26
		on remainder ($118,286 and over)	29

Table 3.6 Corporate Income Tax Rates in Saskatchewan, %

	2005	**2006**	**2007**
Federal			
Small business deduction		12	
Other corporations		21	
General	17	14	13
Small Business*	5.0	5.0	4.5

*The income threshold for small businesses in 2006 was $400,000 of taxable income.

In order to generate this tax savings, the required tax deduction for certified seed is determined as follows.

1. The total cost of certified seed for the representative farm is calculated based on the acreage of each crop (including canola), multiplied by the seeding rate (to give the total volume of certified seed required), then multiplied by the certified seed price[1]. This is

[1] Although a certified-bin run seed spread per bushel is irrelevant for canola, canola must be included as seed expenditure in the percentage tax credit calculation, because canola would receive tax credit and because it must be generally available

presented in Table 3.7 below. As shown in Table 3.7, if the representative farm used only certified seed, its seed cost would be about $86,318.

2. In order to generate a tax deduction of $45,519 on expenses of $86,318, a deduction rate of $50,292/86,318, or about 53% is required. Thus, the appropriate tax credit for certified seed, based on a representative Saskatchewan grain and oilseed farm is 53%.

Table 3.7 Total Expenditure on Certified Seed, Representative Farm, Saskatchewan

	Acreage	Bushels seed	Seed Price ($/bushel)	Total Expenditure ($/Farm)
Wheat	1,395	2,561	8.63	22,089.98
Oats	306	835	6.00	5,009.58
Barley	583	1,528	6.63	10,125.57
Canola	805	129	250.00	32,305.96
Peas	500	1,501	10.50	15,759.85
Alfalfa	82	9	150.02	959.06
Timothy	82	4	74.24	67.56
Total				**86,318**

4.0 Seed Costs for Eastern Canadian Farms

Cost differences between certified and bin-run seed for Eastern Canada were estimated using a representative Ontario grain farm model developed from Taxfiler and Farm Financial Survey data extracted from the Extraction System of Agricultural Statistics (ESAS), a publication from Statistics Canada. The same process was used to capture a description of a commercial eastern Canadian grain farm that was used for the western Canadian farms. Two queries were run in the ESAS database, for Ontario grain and oilseed farms with sales of $250,000 to $500,000 and sales of more than $500,000, to capture revenue and expense data on Ontario incorporated and unincorporated grain and oilseed farms, as well as the average acreage of corn, wheat, soybeans and tame hay for the years 2000-2004. The results of these queries are presented in Table 4.1

To present a picture of a representative eastern Canadian grain and oilseed farm, the results from the queries presented in Table 4.1 were averaged between the two sales categories. The result, summarized in Table 4.2, is a farm representative of commercial grain and oilseed farm with more than $250,000 in sales. The farm averaged over $665,000 in sales, had expenses for tax purposes of $606,284, and realized a net farm income for income tax purposes of $59,025.

The implied seed purchase volume and cost differential between certified and bin-run seed were calculated with the crop acreages given above for the representative farm. To restate the seed cost spreads on a per acre basis, the seeding rates presented in Table 4.3 below were applied. After calculating the spread in $/acre, the spread is applied to the acreages reported for the representative farm with soybeans, wheat and hay (assumes a mix of 75% alfalfa and 25% timothy) as a baseline. The representative farm is 1,183 acres in size, with 456 acres of corn, 350 acres of soybeans, 246 acres of wheat and 132 acres of tame hay.

Based on the acreages in Table 4.2 and the seed cost spread in Table 4.3, the total cost difference for the farm between certified and bin-run seed was calculated. Similar to canola in western Canada, almost all corn in eastern Canada is certified (corn is a hybrid seed), so the option of using bin-run seed corn essentially does not exist. Thus, the spread for corn is irrelevant. Furthermore, the retail price used for seed soybeans is the conventional seed price, despite the fact that almost Round-Up Ready corn comprises almost 70% of the market. The conventional price was used because for those customers who use Round-Up Ready, bin-run seed is not an option due to technology use agreements. Weighting total cost according to acreages of soybeans, wheat and tame hay (75% alfalfa and 25% timothy), the total cost spread between certified and bin-run seed is $17,095 for the farm as a whole. A detailed breakdown of the cost difference is presented in Table 4.4.

Table 4.1 Average Crop Acreages and Taxable Income per Farm, Ontario, by Sales Category

FARMS WITH $250,000 - $500,000 IN SALES						
	2000	**2001**	**2002**	**2003**	**2004**	***Average***
Average acres per farm						
Corn	274	297	241	247	297	*271*
Soybeans	390	335	323	328	372	*350*
Wheat	162	136	135	194	137	*153*
Tame Hay	104	91	98	89	104	*97*
Net Taxable Income/Farm	33,603	33,095	45,891	30,601	33,063	*35,251*
# of Farms	755	865	900	920	865	*861*
FARMS WITH $500,000 PLUS IN SALES						
	2000	**2001**	**2002**	**2003**	**2004**	***Average***
Average acres per farm						
Corn	672	672	664	554	642	*641*
Soybeans	840	705	707	622	840	*743*
Wheat	331	258	309	420	374	*338*
Tame Hay	187	151	197	144	157	*167*
Net Taxable Income/Farm	54,260	84,452	105,733	103,351	66,197	*82,799*
# of Farms	672	672	664	554	642	*641*

Table 4.2 Structure of Representative Eastern Canadian Grain and Oilseed Farm

Corn (acres)	456
Soybeans (acres)	350
Wheat (acres)	246
Tame Hay (acres)	132
Total (acres)	1,183
Average Taxable Income ($)	665,309
Average Taxable Expenses ($)	606,284
Average Net Taxable Income ($)	59,025

Table 4.3 Certified Seed- Bin-run Seed Spreads and Seeding Rates for Eastern Canada

	Spread	**Seeding Rate**	**Spread**
	$/bu	*Bu/acre*	*$/acre*
Soybeans	19.34	1.64	31.63
Wheat	13.82	1.71	23.63
Alfalfa	30.00	0.19	5.80
Timothy	22.27	0.18	3.98

Table 4.4 Farm Level Impact of Seed Price Spread for Eastern Canada

	Total Acreage	**Spread $/acre**	**Certified Seed Price Premium ($)**	**Sum of premium of certified seed ($)**
Soybeans	350	31.63	11,057.40	
Wheat	246	23.63	5,801.86	
Alfalfa	44	5.80	191.49	
Timothy	44	3.98	43.77	
Total				**$17,095**

In order to calculate the tax credit required to make a farm with the financial characteristics of the representative grain and oilseed farm in Ontario equally well off using bin-run or certified seed on an after-tax basis, the total impact of higher certified seed cost must also be calculated. This tax credit is proportional to the cost disadvantage from certified seed use according to the following formula:

$$\frac{(1\text{-Marginal Tax Rate}) \times \text{Cost Disadvantage}}{\text{Marginal Tax Rate}}$$

Tables 4.5 and 4.6 present the personal and corporate income tax rates for Ontario. With a net cash income of $59,025, the Ontario farm has a personal marginal tax rate of 31.15%. The required tax savings is calculated as:

$$\frac{(1 - 0.3115)(17{,}095)}{0.3115}$$
$$=\$37{,}784$$

Thus, a taxable expense of $37,784 for certified seed use is sufficient to make the representative farm indifferent (on an after tax basis) between using and certified and bin-run seed.

Table 4.5 Personal Income Tax Rates in Ontario, 2006

Provincial		Federal	
	%		%
first $34,758	6.05	first $36,378	15.25
On next $34,758 ($34,759 - $69,517)	9.15	next $36,377 ($36,379 - $72756)	22
On remainder ($69,518 and over)	11.16	on next $45,528 ($72,757 - $118,285)	26
		on remainder ($118,286 and over)	29

Table 4.6 Corporate Income Tax Rates in Ontario, 2006, %

	2006
Federal	
Small business deduction	13.12
Other corporations	22.12
General	14
Small Business*	5.5

*The income threshold for small businesses in 2006 was $400,000 of taxable income.

In order to generate this tax savings, the required tax deduction for certified seed is determined as follows.

1. The total expenditure on certified seed for the representative farm was determined. The cost was calculated based on the acreage of each crop, multiplied by the seeding rate (to give the total volume of certified seed required), then multiplied by the certified seed price. This is presented in Table 4.7 below. As shown in the table, if the representative farm used only certified seed (including corn), its seed cost would be about $50,776[2].
2. In order to generate a tax deduction of $37,784 on expenses of $50,776, a deduction rate of $37,784 /50,776, or about 74% is required. Thus, the appropriate tax credit for certified seed for a representative Ontario grain and oilseed farm is 74%.

Table 4.7 Total Expenditure on Certified Seed, Representative Farm, Ontario

	Acreage	**Bushels seed**	**Seed Price ($/bushel)**	**Total Expenditure ($/Farm)**
Corn	456	171*	160**	27,364.59
Soybeans	350	571.74	25.80	14,750.87
Wheat	246	419.82	18.00	7,556.69
Alfalfa	44	8.5	150.02	957.47
Timothy	44	7.9	74.24	145.89
Total				**$ 50,776**

*Bags of seed required, assuming 30,000 kernels/acre and 80,000 kernels/bag
** Price per bag

[2] The rationale for including corn in the percentage tax credit while excluding it from the certified-bin run spread is analogous to that discussed above for canola.

5.0 Government Cost of a Certified Seed Tax Incentive

In order to estimate the total government cost of a certified seed tax incentive, the total number of grain and oilseed farms in Canada (by province) with sales of $250,000 and over was queried through the Statistics Canada Extraction System of Agricultural Statistics. The results of this query represent an estimate of the target population of cash crop farms for the tax incentive. This is illustrated in Table 5.1 below. The total value of the tax credit was estimated by multiplying the tax savings required by the number of farms. The tax savings required for Saskatchewan farms, which was $45,519, was multiplied by the number of farms in Saskatchewan, Alberta, Manitoba, and British Columbia, as grain and oilseed farms in these provinces have a similar makeup. The tax savings required for Ontario, $37,784, was multiplied by the rest of the grain and oilseed farms, including farms in Ontario, Quebec and Atlantic Canada. Finally, the same steps were followed to calculate the total expenditures on certified seed by Canadian farmers. Given the totals costs and the total tax savings, a new tax credit rate can be calculated, that would be applied to all farmers in Canada. The government cost of the program is the value of the tax credit multiplied by the marginal tax rate in each of the two regions.

The table shows that the total value of a certified seed tax incentive is about $521 million. The majority of this is allocated in western Canada, which has the largest number of grain and oilseed farms. The average per farm tax credit value and expenditures on certified seed can be calculated by dividing through by the total number of grain and oilseed farms. The average per farm tax credit is $44,104 and the average expenditure on certified seed is $79,817. In order to generate a tax credit of $44,104 on expenses of $79,817, a tax credit rate of $44,104 /79,817, or about 55% is required. Thus, the appropriate tax credit for certified seed for a representative Canadian grain and oilseed farm is 55%. The cost of the credit (reduced tax paid to government) is the value of the tax credit multiplied by the marginal tax rate. When the marginal tax rates in Ontario and Saskatchewan are applied to eastern and western tax credit levels, respectively, the total government cost is just over $179 million.

Table 5.1 Government Cost of a Certified Seed Tax Incentive in Canada

	No. of Grain Farms (Sales of $250,000 +)	Tax Savings Required ($)	Certified Seed Expenditure ($)	Total Value of Tax Credit ($)	Total Expenditures on Certified Seed ($)	Total Government Cost ($)
Eastern Canada	2,160	37,784	50,776	81,612,478	109,675,093	25,422,287
Western Canada	9,650	45,519	86,318	439,259,064	832,964,406	153,740,672
Total Cost to Government	11,810			520,871,542	942,639,499	179,162,959
Average Per Farm Cost		44,104	79,817			

As an alternative to a tax credit proportional to certified seed purchases, a simple deduction on tax liability that is equivalent to the tax credit on purchases can be structured. The flat tax deduction for the representative farm is simply the cost spread between certified and bin-run

seed, multiplied by (1-marginal tax rate). To establish this value on a national basis, the tax deduction applying to the two representative farm models was calculated, and then combined in a weighted average using the number of farms in eastern and western Canada from Table 5.1 above as weights. The results are presented in Table 5.2 below. The flat tax deduction equivalent to the tax credit described above is $15,170 per farm.

Table 5.2 Tax Deduction for Certified Seed Use

	Certified Seed Cost Differential ($)	Marginal Tax Rate	Tax Deduction ($)	Proportional Weight
East	17,095	0.3115	11,770	18.3%
West	24,510	0.35	15,932	81.7%
National Tax Deduction			**15,170**	

6.0 Potential Benefits of a Certified Seed Tax Incentive

The above sections consider a tax incentive that would equate the cost to producers of certified and bin-run seed on an after-tax basis. No reference was made to the benefits of certified seed. This section provides a brief survey of the benefits of increased certified seed use through an enumeration of benefits, and through estimates from previous research.

The basic conception around the benefits of certified seed adoption is that purity of genetics and constant innovation and improvement in seed genetics results in benefits for the entire food supply chain. These benefits can be fragmented as follows:

- Maintenance of quality from farm to food product. Increasingly, food products are differentiated according to specific attributes relating to health, colour, functional characteristics, etc. Stiefelmeyer *et al* note that these products present the key source of growth in demand for foods in the domestic market. The attributes contained in differentiated foods are commonly related to attributes contained within the farm product from which it is manufactured, and the additional value from these foods is the source of premiums for differentiated farm products. However, it is very difficult to establish or maintain value chains to deliver these products if the genetic purity of the initial product is uncertain. Indeed, latent value chains may simply not develop if there is uncertainty regarding the integrity of the initial seed genetics. As such, certified seed can act as a facilitator for value chains and a certifier that can assist with downstream product claims.
- Related to the above, the use of certified seed can decrease the incidence of downstream food product mislabeling. Certified seed allows for the tracking of food product attributes back to seed genetics; this is an effective check against false claims on food and intermediate products. It also facilitates the development of food products that are differentiated in a manner that is not readily observable.
- Increased incentive for seed research and development in Canada. By increasing the rate of use of certified seed in Canada, the profitability of firms developing certified seed in Canada will increase, and the incentive for investment in Canadian seed genetics research will improve. The result would be an increased proliferation of improved seed varieties in Canada, increased profitability of seed developers, and increased economic activity. This effect could be material. For example, a 2004 study by Martin *et al* that considered a smaller subset of crops than this study, and only considered western Canada. It found that based on a Statistics Canada sales multiplier of .77, the indirect economic effect of a tax credit that induced full use of certified seed was $615 million per year. It was also estimated that the increased profitability to seed firms would create about $50 million per year in additional taxes paid
- Increased farm profitability. As a result of increased certified seed use, farmers should expect to see increased profitability due to improved agronomic performance. This result was not observed in the literature (perhaps because too many confounding factors exist in comparing yields from certified vs. bin-run seed) but the rationale clearly exists.

Thus, a range of benefits exists from increasing adoption of certified seed via a tax incentive mechanism, and these benefits are likely to be material.

7.0 Conclusion

Based on representative cash crop farms taken from Saskatchewan and Ontario, respectively, and aggregated to the national level, the certified seed tax credit that equates certified and bin-run seed costs on an after-tax basis is 55%. Alternatively, it can be structured as a deduction of tax liability of just over $15,000 per farm. The annual value of the tax credit is about $520.8 million; the tax payable to government forgone is about $179 million per year.

It should be recognized that programs of the sort conceived here encounter some uncertainty (and therefore caveats in terms of interpretation) because they are run through the tax system. The first source of uncertainty is the rate of participation. Participation in tax credit programs should be of interest to commercial farms that are profitable and would otherwise face tax liabilities; we have interpreted this as farms that are in excess of $250,000 in sales. In fact, some farms operating at lower scales may be interested in participating in the program, and some relatively large farms that are struggling to be profitable may elect not to participate. There is also likely to be interest from some mixed crop/livestock farms, but the extent of this is more speculative. Thus, actual participation may differ from what is suggested here, which will influence the value of tax credits and government cost.

Secondly, the design of the tax incentive conceived of here is effectively an average of that across different crops, when in fact a different spread between certified and bin-run seed exists for each crop. While this is necessary to meet the standard of a “generally available” program, the potential exists that some farmers will use the tax credit for purchases of certified seed in which the cost spread exceeds the spread embodied in the tax credit, but not for those in which the cost spread is below that in the tax credit. If farmers reacted in this manner, the tax credit would not have the intended effect. However, in practice it can be questioned whether farmers would go to the effort to disaggregate the tax credit in such a way.

Third, the cost to government of the tax incentive is likely to have been overstated through the use of conservative assumptions. Under the tax credit, the line item for certified seed expense would be structurally increased, thus lowering taxable income and decreasing taxes payable. The means of estimating the tax credit to accomplish this assumes that revenue would remain unchanged. One would expect that the improved quality of certified seeds would have the effect of increasing revenue relative to bin-run seed. To the extent this occurs, revenue would increase along with the increased taxable expense for certified seed, mitigating some of the tax savings. Thus, the government cost of the tax incentive could be lower than stated here.

Finally, the apparent weakness of the above tax incentive design is its position with respect to trade rules. Under the assumption that the design would allow Canada to report the program as non-product specific, Canada would need to report the program as non-product specific distorting support under WTO, the cost of the program would need to fit within Canada’s allowable Aggregate Measure of Support (AMS). The current AMS for Canada is $4.4 billion; however, if the current Doha Round results in a successful agreement, it is expected that Canada would need to reduce its AMS to $2.2 billion. In the context of an AMS cap of $2.2 billion, $180 million in a tax incentive for certified seed could be seen as material (approaching 10% of the total). Moreover, if it was determined that the tax incentive was product-specific AMS, the danger exists that Canada could simply exceed its commitments for certain crops. Thus, the optimal approach for implementation of the tax incentive would be as a WTO “green”, thereby avoiding non-product specific AMS and product specific issues altogether. It remains to be seen how the tax credit could be packaged as a green program for WTO purposes.

References

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