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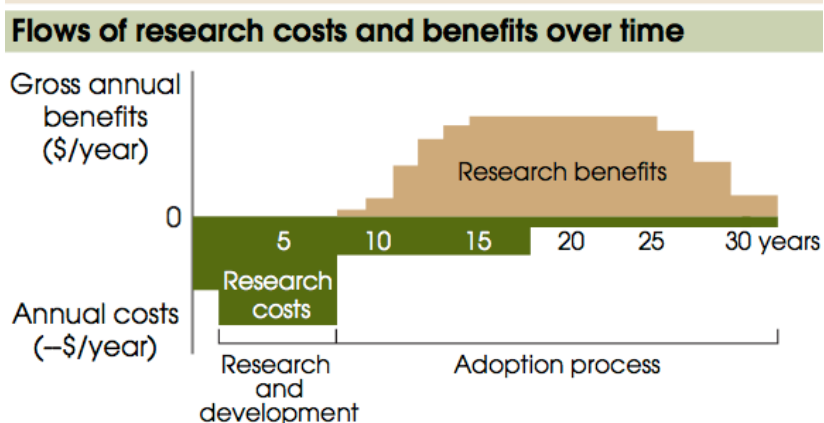
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Program Spending Returns – A Policy Brief¹

A highly respected Canadian agricultural economist, Dr. George Brinkman, wryly observed that “**Agricultural research is Canada’s most effective farm assistance program**”.²

Funding agricultural R&D is a very efficient way to transfer income to producers. **Each dollar invested in R&D returns more than one dollar.** This is because an investment in agricultural R&D, occurring over several years, produces large benefits over a long time frame, about 20 years. As shown below, during the development of the new technology, typically a seven year process, there are no benefits, only costs. However, as producers begin to adopt the technology which increases average productivity, benefits from lower costs or increased productivity occur. After adoption is complete, in about eight years, the benefits will continue for about 15 years. Not all of the benefits remain with producers. For example, increased production can lower prices and this benefits processors and consumers.³



Source: Alston, Norton, and Pardey, 1995.

Source: Fuglie K and P Heisey, “Economic Returns to Public Research”, Economic Research Service, 2007

Investment in agricultural R&D produces large returns, as measured by the internal rate of return and benefit cost ratio. Estimates of the internal rate of return to society typically range from 40% to 60% while the benefit cost ratio ranges from 10:1 to 15:1 (every dollar spent results in benefits of \$10 to \$15). **Different types of agricultural R&D can vary in terms of return.** The Economic Research Service argues that publically supported basic or pre-technology research has the highest return, followed by applied public research, private research, farmer education, and agricultural extension.⁴

Spending on farm programs does not create large returns. Alston argued that in 2007 US farmers received only 50 cents from each dollar of US government spending. The remainder was captured by

¹ This policy brief presents some key findings of “Returns to Program Spending in the Agri-food Sector: Evidence from the Literature”, December 2010 by SJ Thompson. This paper was commissioned by the Canadian Agri-Food Policy Institute.

² Klein K, “Publicly Funded Research in Agriculture: Time for a Shift in Paradigm?”, CAES Annual Meeting 2000.

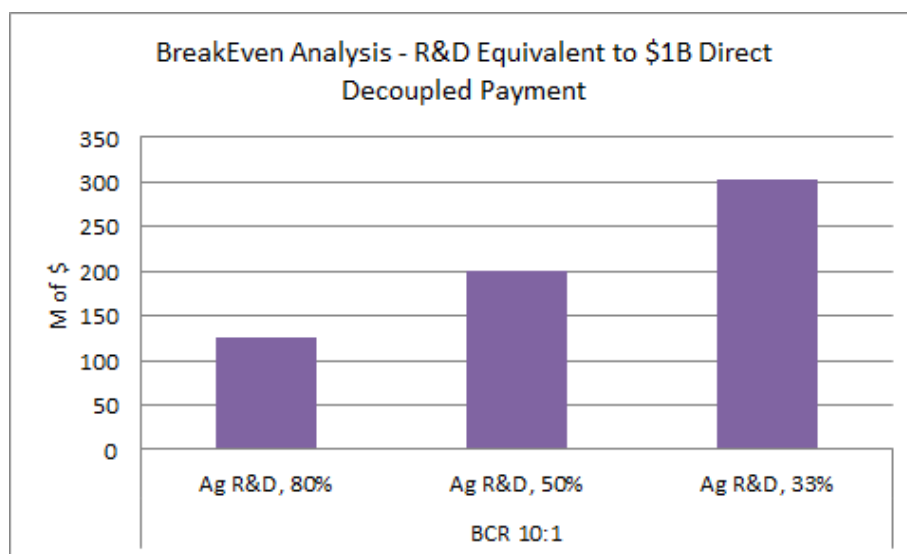
³ Fuglie K and P Heisey, “Economic Returns to Public Research”, Economic Research Service 2007.

⁴ ERS, “Economic Returns to Public Agricultural Research”, in Agricultural Research and Development, 1996.

those renting land to producers (25 cents); domestic and foreign consumers (20 cents) and no one (waste). The amount staying with producers depends on the type of farm support. Support tied to production affects production decisions allowing others to capture some of the farm payment. If the support is not tied to production (decoupled payment) then the producer will receive 100% of the funding.⁵

The following example illustrates why agricultural R&D is more effective in benefiting producers than direct payments. A \$1 B direct payment to producers will benefit producers by the full \$1 B if the payment is decoupled from production and by a lesser amount if the payment is tied to production. Let's assume that the producers receive a decoupled payment so that they retain 100% of it, or \$1 B. **How much would have to be invested in agricultural R&D to provide an equivalent amount of benefit to producers?**

If 80% of the benefits of the agricultural R&D are captured by producers, then a \$125 M investment will return \$1 B to producers. If producers capture 50% of the benefit, then a \$200 M investment provides the same amount of benefit to producers as a \$1 B direct decoupled payment. Even if producers retain only one-third of the benefit, the investment in R&D is still more cost effective.



Compared to farm programs, agricultural R&D is a very good investment. However, if agricultural R&D is such a good investment, why isn't more of it funded? The first explanation is that producers and policy makers don't believe the estimates of the returns to research. Also, producers can lose from technical change. Secondly, the distribution of benefits between producer groups may be important to

⁵ Alston J, "Efficiencies of Income Transfers to Farmers Through Public Agricultural Research: Theory and Evidence from the United States", *AJAE*, Volume 91, 2009.

policy makers. Finally, there is a lengthy time lag between making the investment in R&D and reaping the rewards.⁶

⁶ Alston J, “Efficiencies of Income Transfers to Farmers Through Public Agricultural Research: Theory and Evidence from the United States”, *AJAE*, Volume 91, 2009.