Rates of Return to Crop Research in Canada

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Is Ag Research Still a Good Investment?

- Ag research was once seen as integral to the National Policy
- Saunders 1885 Federal Experimental Farms
- Summer fallow
- Marquis wheat first early maturing HRS - 100th birthday
Arguments have changed

- No longer seen critical for national development
- Private sector might do the job
The Privatization of Canola

Research expenditure in the Canola Industry (1960-1999)
So What’s the Current Motivation?

- Global food security?
- Energy/GHG reduction?
- Maintain farm income?
- Cost effective tool for economic growth?
- High rates of return are a prerequisite for continued funding
Estimation Issues

• The cost side
  - Attribution - what expenditures cause what?
  - Expenditure data - now an big issue with ICAR gone
  - Distribution of costs - who pays?
Estimation Issues

- Benefit side
  - Data
  - Stochastic and lumpy research results
  - Knowledge stock effects
Estimation issues

- Distribution of Benefits
  - Domestic versus foreign
  - Producers, industry, consumers

- External (to market) effects
  - Research spillovers & education
  - Health benefits - 10% of GDP
  - Environmental benefits (GHG)
Overall Assessment

• Lag structure
• Rate of knowledge depreciation
• What is the counter factual? - if investment was not made what would have happened?
  - Always compare what happened to what would have happened
Research Returns International Evidence

- Alston, Marra, Pardey and Wyatt (1998)
- collected 294 studies post war of returns to R&D investment
- Returns averaged:
  - 64.2 percent/yr. for research only
  - 75.6 percent/yr. for extension only
  - 46.3 percent/yr. for combined

- “There is no evidence to support the view that the rate of return has declined over time...” (p. 27)
Canadian Evidence

- “...The benefit-cost ratio was 27.5:1 for the aggregate total of Ontario agricultural research undertaken between 1950 and 1972.
- “Research studies in western Canada also show high returns, with benefit-cost ratios ranging from 12.1:1 to 34.1:1 for barley, wheat and rapeseed, and 37.1:1 for beef”
Internal Rate of Return for Canola Yield Increasing Research (1967-97) - Malla and Gray
The Privatization of Canola

Figure 1: Research expenditure in the Canola Industry (1960-1999)
Estimated net present value of yield increasing wheat variety research output Canada (million dollars) 1960-1999
Summary

- Generally high rates of return rate of return
- Canola rates have been declining
  - Large increases in private funding
  - Hybrid technologies have not been assessed
  - Some FTO issues are emerging
- Wheat still has high but sporadic rates of return
- Pulses early research results are promising
Conclusions

• Generally high rates of return
  – There is still an under investment in research
  – Consistent with spillovers and grower rights
  – Many types of R&D are not evaluated eg.
    • Crop disease prevention
    • Extension
    • Machinery innovation
High Rates of Return Does Not Answer:

- Who should fund research?
- Which types of research should be funded?
- How should research be governed?
The End:
I look forward to your questions