

A landscape photograph of a rural field with a rainbow in a dark sky. The foreground shows a green field with a dirt road on the right. The middle ground features a yellow field and a line of trees. The sky is dark and overcast, with a vibrant rainbow arching across it.

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

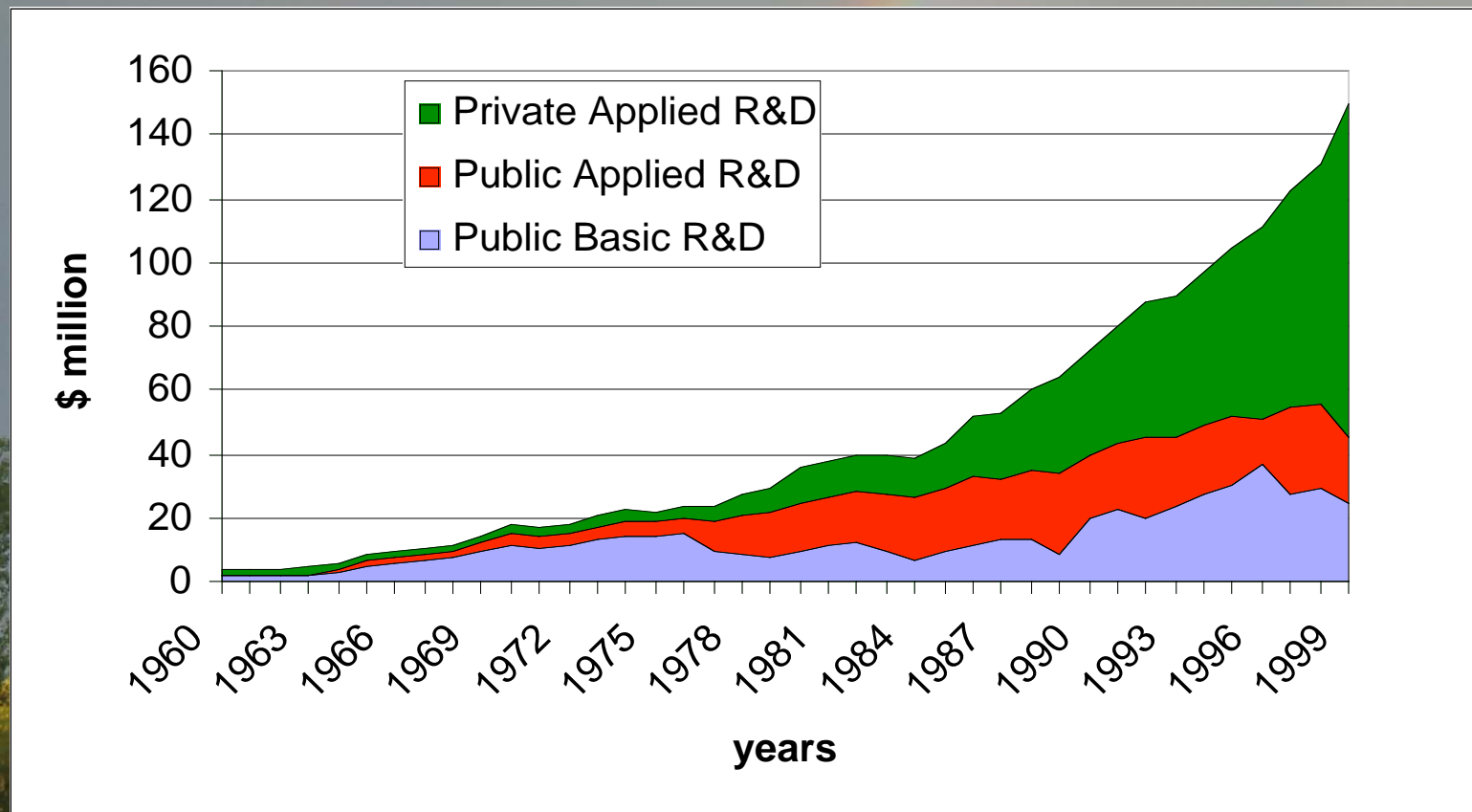


Arguments have changed

- 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

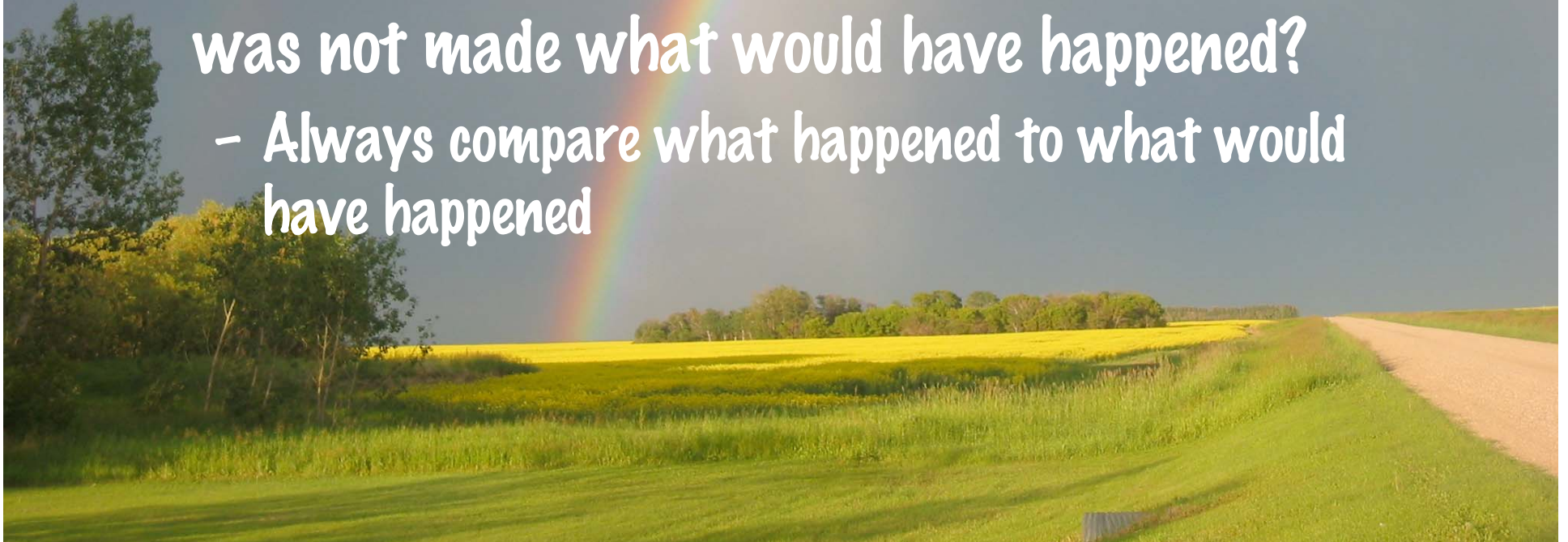


Estimation issues

- 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 counterfactual? - if investment was not made what would have happened?
 - Always compare what happened to what would have happened



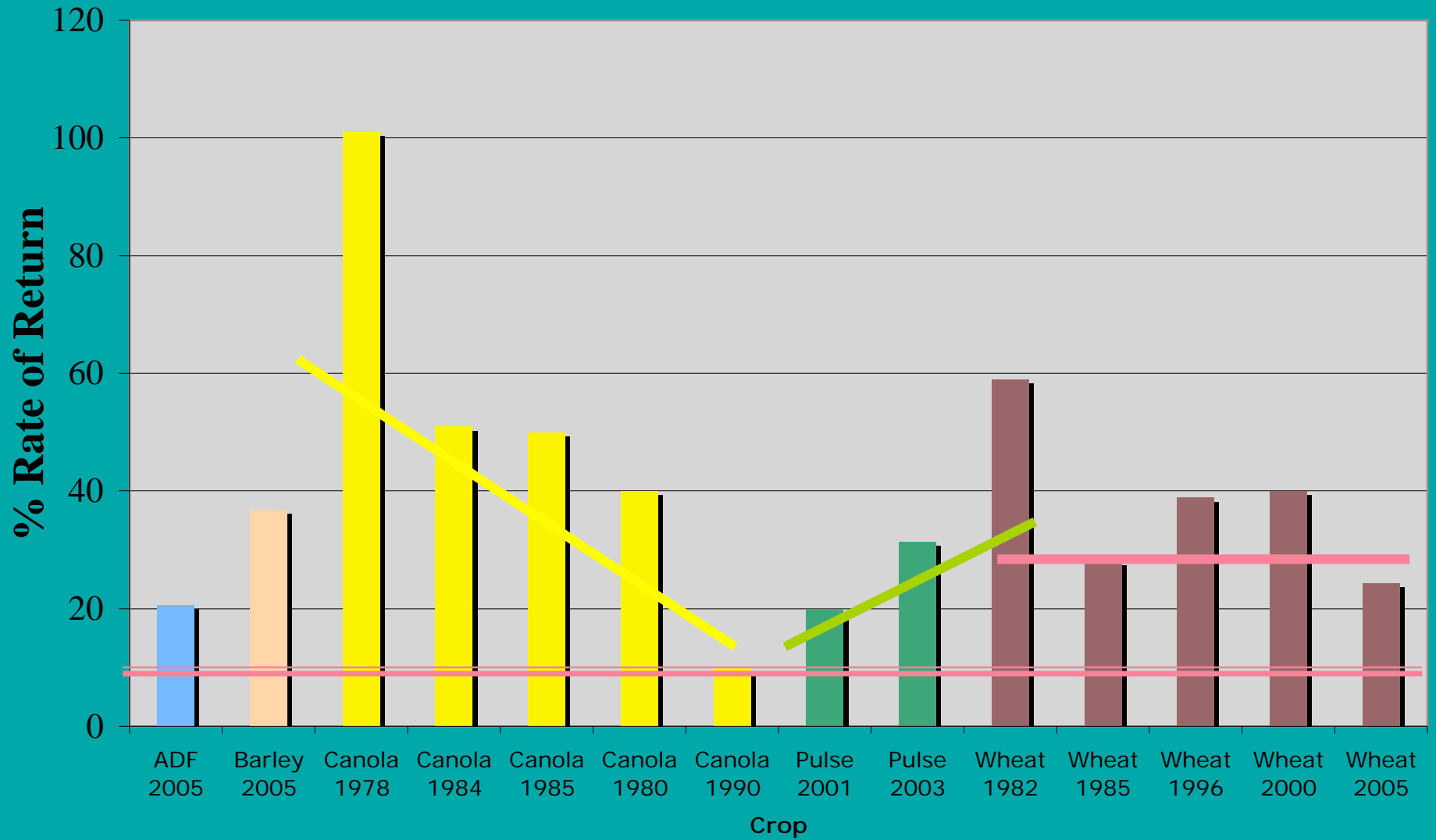
Research Returns International Evidence

- 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)

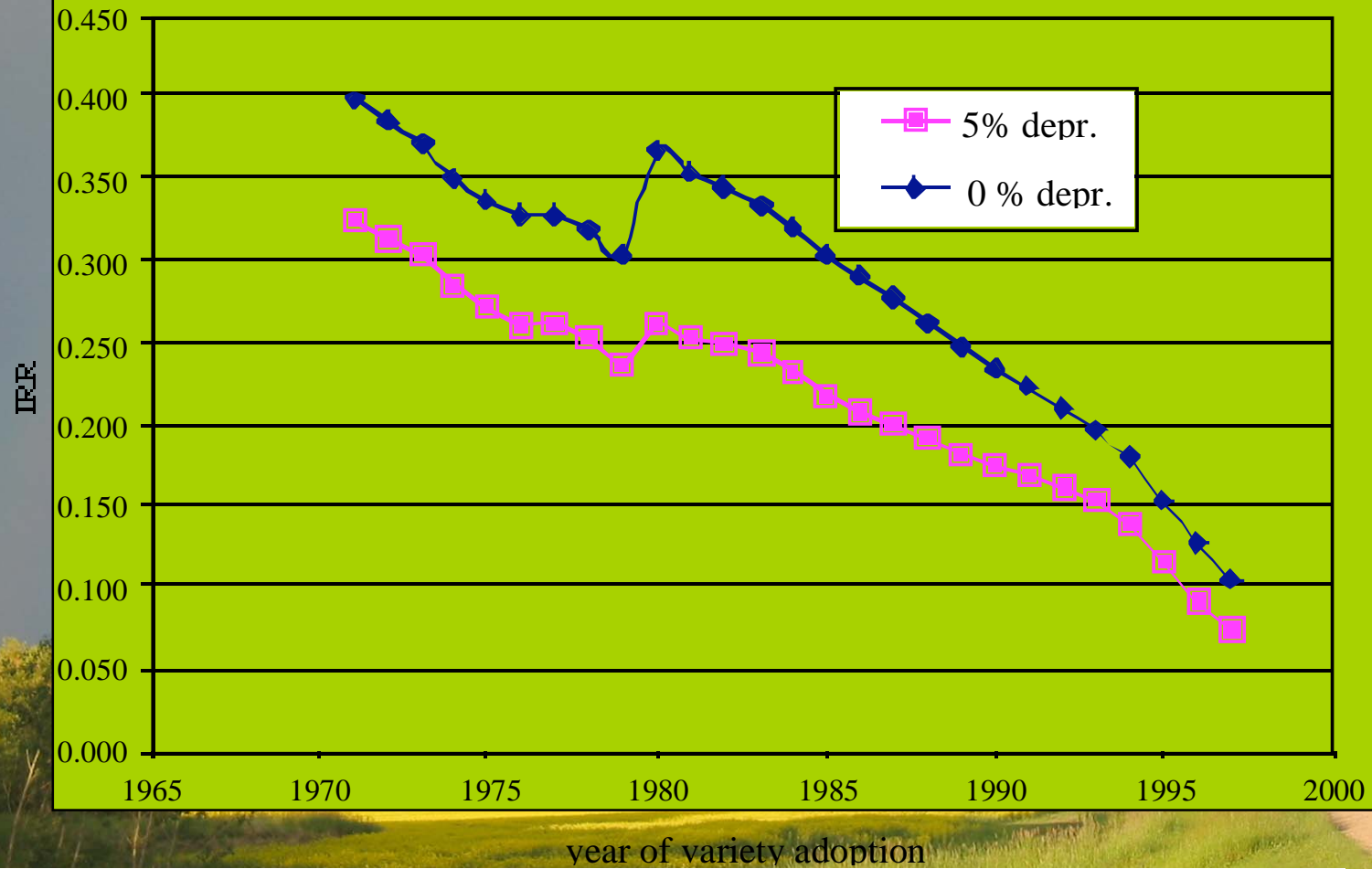
Canadian Evidence

- Brinkman (2004) Summary of returns Canadian studies from 1978- 2001
- “...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”

Crop Research Internal Rates of Return



Internal Rate of Return for Canola Yield Increasing Research (1967-97)- Malla and Gray



The Privatization of Canola

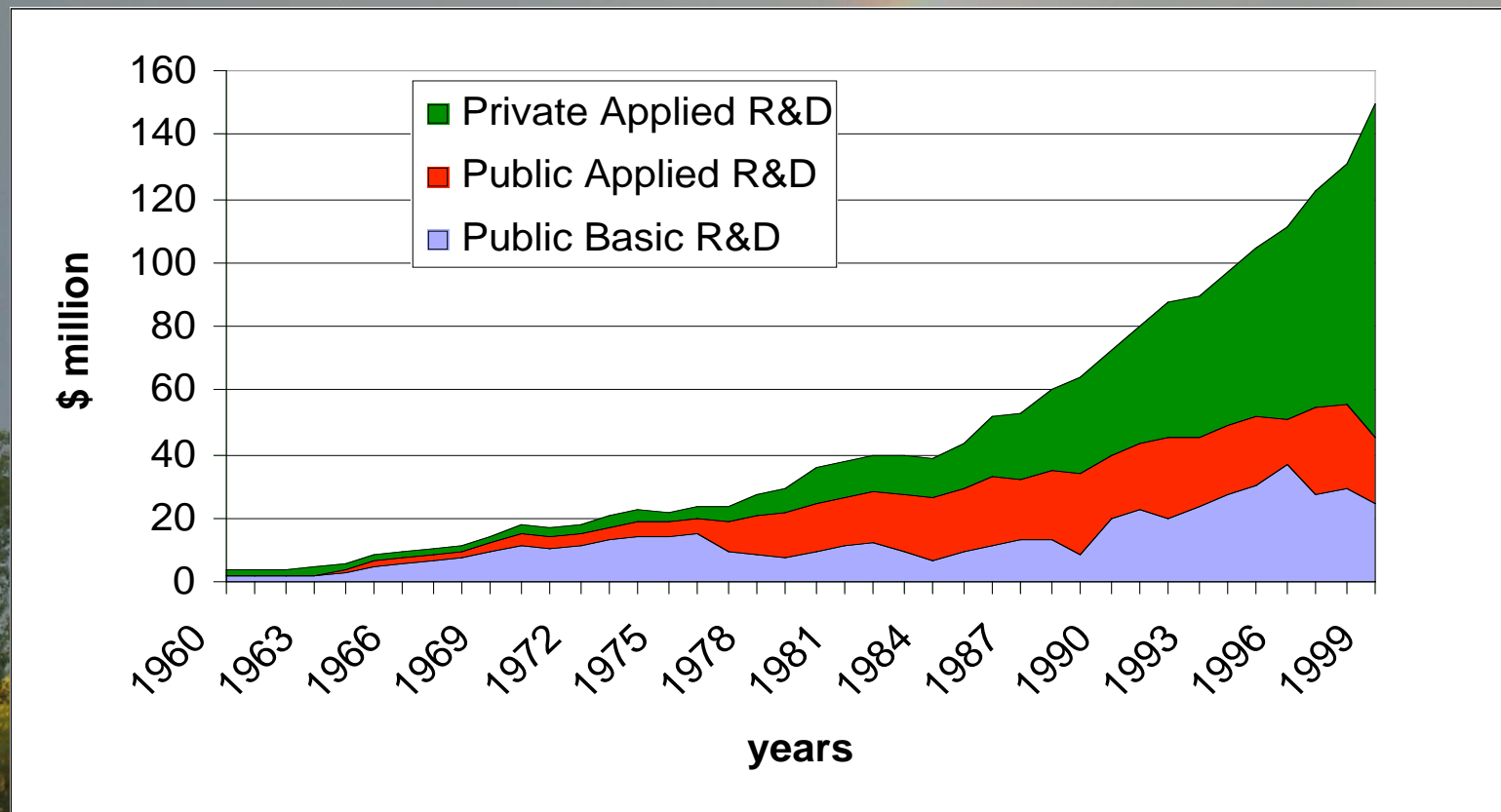
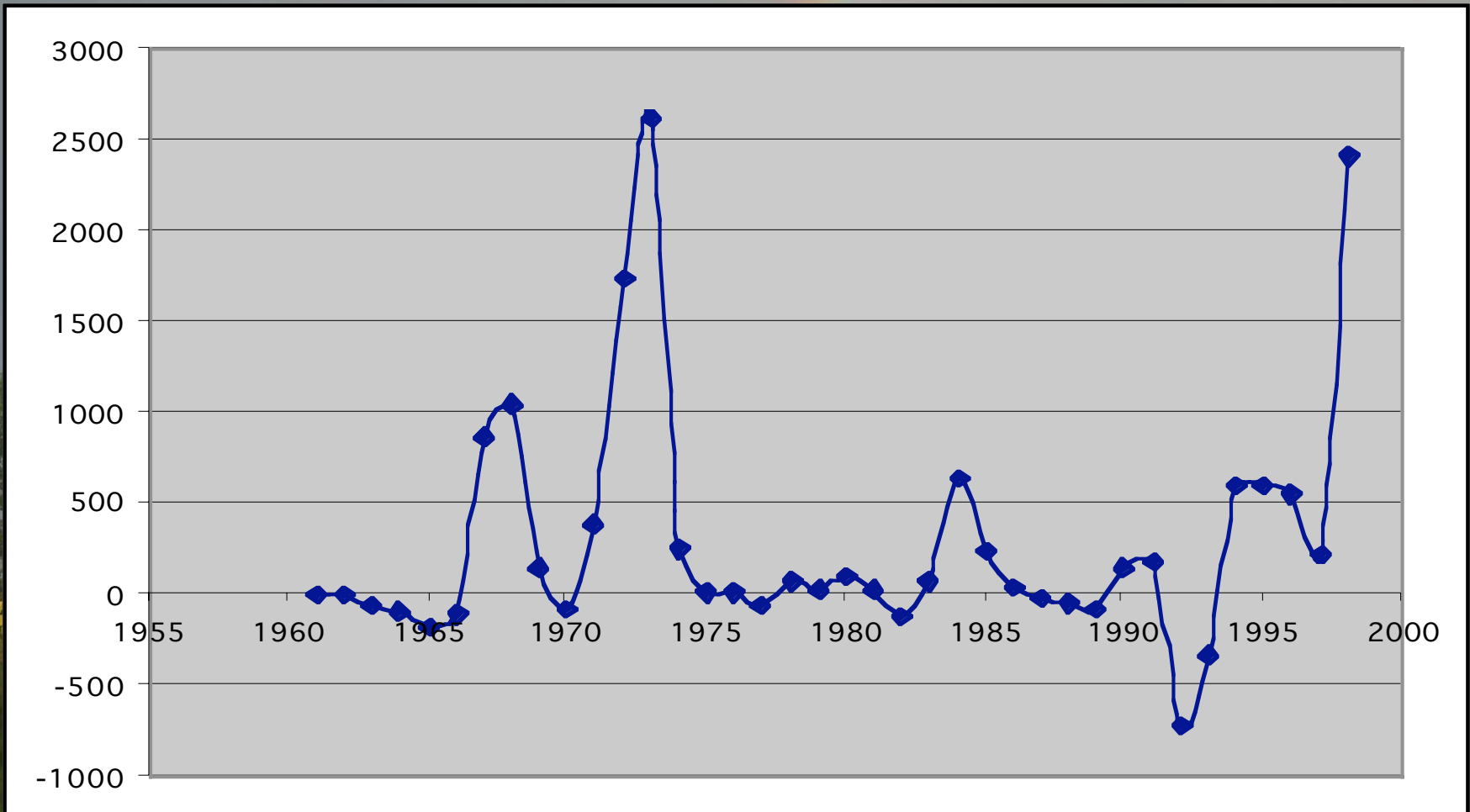


Figure 1: Research expenditure in the Canola Industry (1960-1999)

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?



A landscape photograph featuring a vibrant rainbow arching across a dark, overcast sky. Below the rainbow, a bright yellow field stretches across the middle ground, bordered by green grass and trees. A dirt road curves through the foreground on the right side. The overall scene is a mix of natural beauty and dramatic lighting.

The End:

I look forward to your questions