

# Canola Breeding and Freedom to Operate

Food & Fuel: The Implications for  
Agricultural Research Policy

June 4-6, 2007 Saskatoon SK

Murray Fulton

Agricultural Economics



UNIVERSITY OF  
SASKATCHEWAN

# Canadian Canola Research Environment Before 1980s

- Public sector dominated
- Lack of intellectual property rights (IPRs)
- New technologies and new varieties released for use without any restrictions
- Relatively free information flow



# Policy Shift in 1980s

- New DNA technologies allowed IPRs over germplasm, cultivars, gene sequences & markers to be identified and safeguarded
- Canadian Intellectual Property Office allowed patenting of single-celled organisms and within-cell events in 1982
- Significant pressure to cut agricultural R&D spending
- Introduction of Plant Breeders' Rights in 1990



## Canola varieties developed by institution and by year

<i>Years</i>	<i>1940- 1959</i>	<i>1960- 1969</i>	<i>1970- 1979</i>	<i>1980- 1984</i>	<i>1985- 1989</i>	<i>1990- 1994</i>	<i>1995- 1997</i>
<i>Public institutions</i>	<i>4</i>	<i>6</i>	<i>8</i>	<i>6</i>	<i>10</i>	<i>12</i>	<i>8</i>
<i>Private companies</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>9</i>	<i>32</i>	<i>75</i>

Source: Phillips (2001)

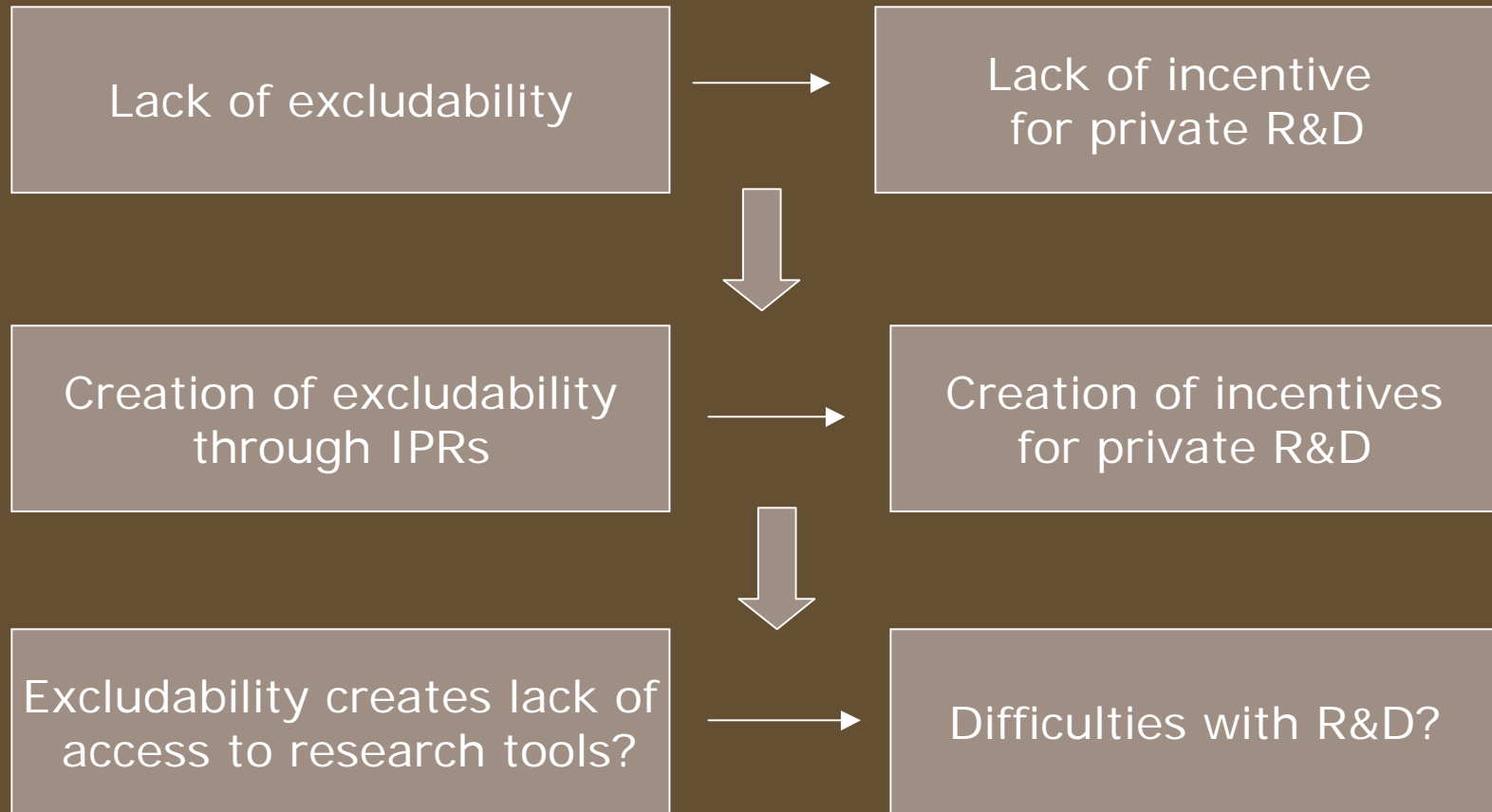


UNIVERSITY OF  
SASKATCHEWAN

# The Issue

- Introduction of IPRs has clearly resulted in additional private research – i.e., IPRs solved the public good problem
- Theory suggests IPRs may have other impacts
- Do IPRs create too much excludability in intellectual property? Do they increase barriers to research?
- Do IPRs have other impacts on the way R&D is carried out?





# Tragedy of the Anticommons

- Freedom to operate is linked to what has been termed the “tragedy of the anticommons”
- Close connection between the “tragedy of the anticommons” and the “tragedy of the commons”
- Key papers by Heller; Heller and Eisenberg; Buchanan and Yoon



# Tragedy of the Commons

- Classic examples – open access fisheries, common grazing lands
- Problem is that there are multiple users that cannot be excluded – the result is overfishing or overgrazing
- Each party tries to exploit the common property, with the result that the value of the property is not realized

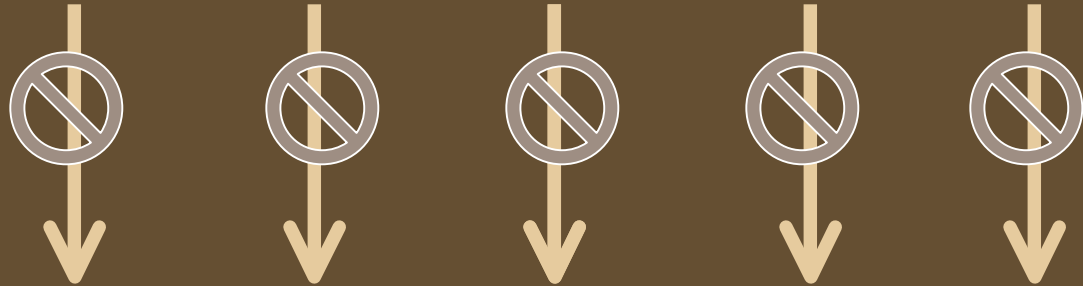




# Tragedy of the Anticommons

- Classic example – closed store fronts on Moscow streets
- Problem is that there are multiple owners, each of which can exclude – the result is lack of development
- Each party tries to exploit the common property, with the result that the value of the property is not realized





UNIVERSITY OF  
SASKATCHEWAN

# Is There Evidence That This Happens?

- Reduced access to free material
- Increased secrecy
- Less sharing
  
- For details see Emmanouil Oikonomou's poster and an upcoming policy brief.
- Data and quotes based on interviews with eight canola breeders.



# IPRs Affect IP Strategy

## Private and Public

- “... but as long as we have something patentable we will try to patent to make sure that we will have freedom to operate and that we have something to trade”
- Q: “Has your protection of research tools increased over the last 5-10 years?”  
A: Yes, absolutely.  
Q: Why did you increase protection?  
A: The business office wanted it to ensure the freedom to operate.”



- Q: “Why did you increase your patenting?”

A: Primarily [it] is defensive response to make sure we have freedom to operate. We are not very concerned about [recouping] R&D expenditures, [it] is primarily to secure freedom to operate.”



# Added Element to Private Strategy

- “So if we know that there is a patent out there that there is the possibility that covers our material then we would like not to touch it.”
- “We watch to make sure that new IP is not brought out because we are starting to see more combo patents, ... submarine patents.”
- “Q: When you are using research tools, how often do you look into their IP access?  
A: Always.  
Q: How often do you use patented material?  
A: Never”

- “But almost everybody in our industry can see the fact that the freely publicly available material for release without any burdens has dried out. So we are really locked in a point where 1995, 1998, 2000 was the last time where you could freely access material germplasm and that changes. So anyone that has not access to that material is, in long term, is going to find it pretty difficult.  
... the choices that you make as a research organization really impact now what kind of bottom-line you have 5 years from now, but really impact the next 10-15 years. You choose the right research path to develop some very valuable IP and if it is the right area you can reap the rewards for a decade. It is risky but phenomenal.”

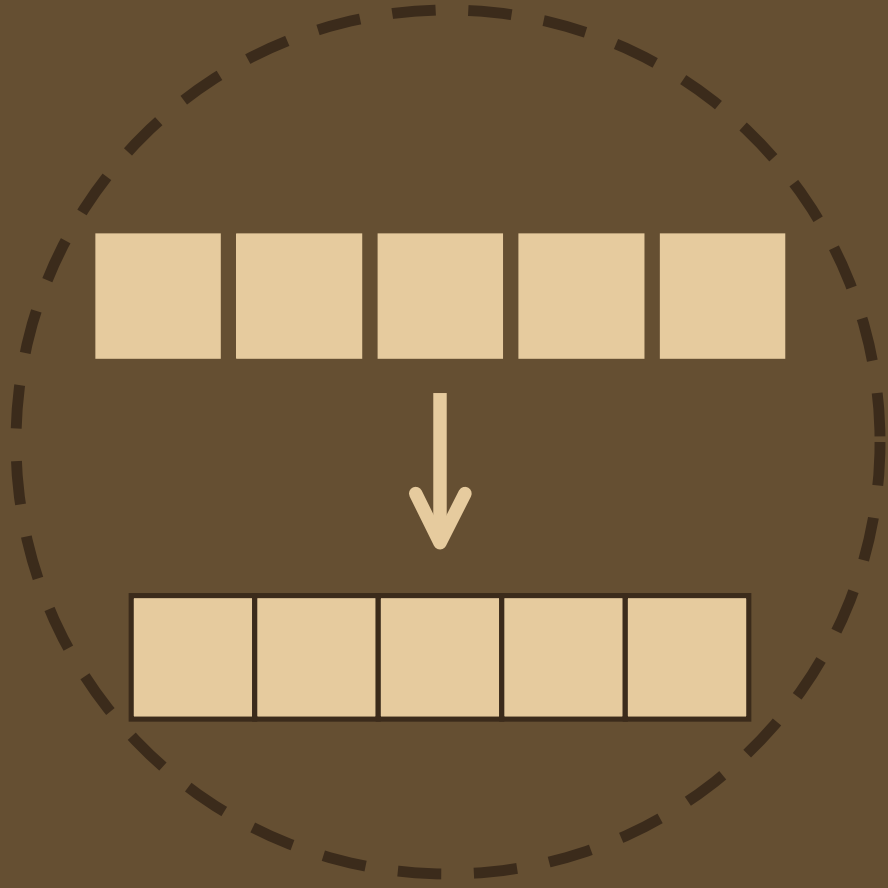
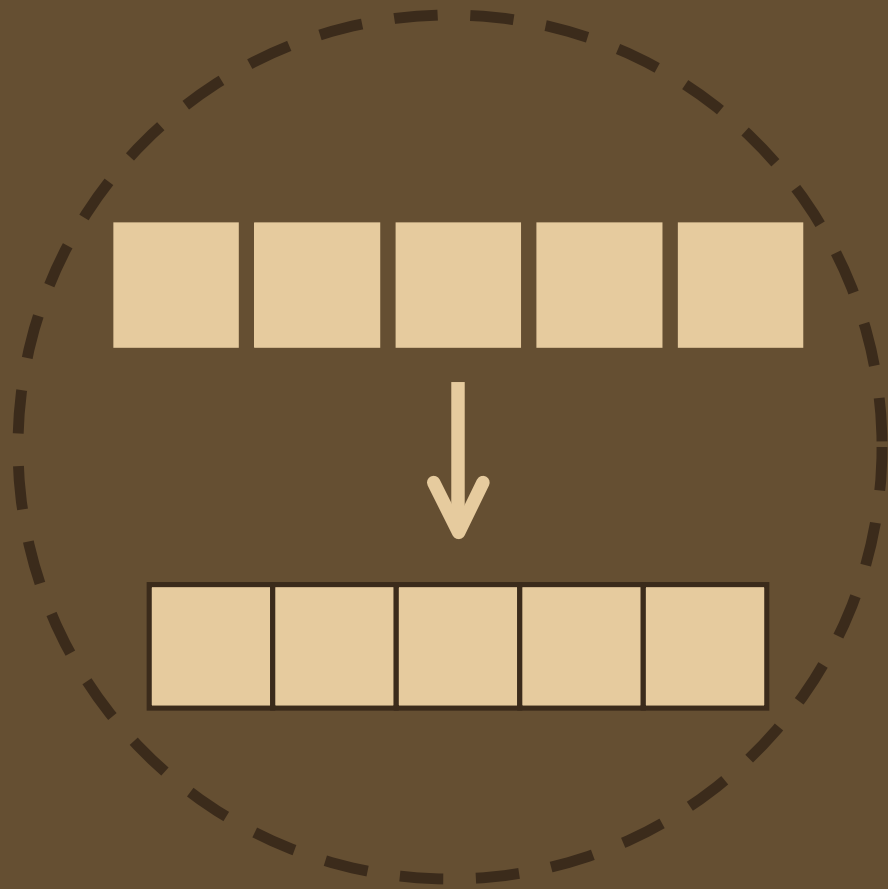


# Evidence of Collaboration

- Particularly with public agencies because they are “giving us marketable credible data to go to customers with”
- “even private organizations, where at one point, seem to have limitless money, limitless research possibilities, but we are all limited to what we can do. So, if you find someone that has the expertise ...”
- [We] will start small directed research project with small companies, small start-ups and occasionally will buy them based on potential for intellectual property.”







UNIVERSITY OF  
SASKATCHEWAN

# Key Points

- IP protection has increased private R&D investment in canola
- Evidence that IP protection is affecting the sharing of information and IP management strategies
- Both public and private sectors attempting to develop their own platforms that give them freedom to operate
- Particularly strong in the private sector



# Thank You



UNIVERSITY OF  
SASKATCHEWAN