Freedom to Operate
Issues, IPRs & Second Generation Commercialization

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Owning Land in Greece

- In the 1920s new private land ownership
- When land was bequeathed it was tradition to give in joint ownership to all the children
- Typically five owners of each piece of land - resale became difficult
- With the second generation many pieces of land have 25 owners
- Very high transaction cost - land market has almost seized up
- Lesson - IPRs and how they are used really matter
Outline

- Public good aspects of knowledge
- New IPRs for life sciences
- The birth and development of the Agbiotech sector
- The constipation of the Agbiotech sector – where are the second generation products?
- Joint ownership and Freedom to operate issues
- Gaining freedom to operate
- Second generation crops
The public good nature of research

- Ideas and products of research can be used over and over again - (non-rival)
- Its research output is easily copied, borrowed - non-excludable
- Patent system has been very important for the industry
- In crop research public investment was required because there were few private incentives
How Intellectual Property Rights have changed for crop research

- Three forces
  - New regulations/laws
  - Court interpretations
  - Gene identification

- The result
  - Research can be made into property with a patent giving a monopoly to the creator (owner) of the process of product

- more incentive for private research
- Large economies of scale -
- Many pieces of IP on one product
The creation of ag biotech industry

- Private research has exploded
- First generation input traits have been successful in Corn, soybeans, cotton and canola
- The industry has become very concentrated owned by pesticide companies
- Public institutions are pulling out of applied research
Research spending in Canola

- Private Applied R&D
- Public Applied R&D
- Public Basic R&D

$ million

years

Research Revenues in Canola

![Graph showing research revenues in canola over the years.](image-url)

- TUA/HT rent
- Private
- Public Revenue

$ million


year
Figure 8. Numbers of M&A events by crop and total of five crops, 1988-2002.
Figure 1. Concentration of field trial activity and number of firms, 1988-2002.

M. Brennen et al. (2004)

Note: Data from USDA APHIS (2002).
Constipation of Value Enhanced Crop innovation

- Value enhanced crops accounted for more than 4.31 million
- With non-transgenic varieties accounting for more than 95% of area
- As of 2004 only two transgenic VEC
Note. Data from USDA ERS (2004).
Note. Data from USDA APHIS (n.d.). M. Brennen et al. (2004)
Problems with second generation commercialization

- Freedom to operate is a real problem
- Small markets can’t support the transaction and regulation costs
- Second generation requires linkage with value added supply chains
What is freedom to operate?

- obtaining the legal rights to commercialize a product
- FTO for research a product generally does not give FTO to commercialize
- An agreement with the owners of each process IP and each genetic IP is required for commercial use
Why is this an issue?

- new varieties can have many separate pieces of IP
- The firm wishing to commercialize needs a signature from each owner
- Each owner can hold up the process and will want a share of the profits
- Bargaining takes place after costs are sunk
- A hold up problem may exist
What is the hold up problem?

- An investment is not undertaken by one party for fear of ex post opportunistic behavior of the other agent(s)
- Investment stalls
Why is problem more severe for second generation products?

- More pieces of IP
- Supply chain hold ups - products need markets
- IP is concentrated in Life science companies and food companies are reluctant to risk brand names
The Results

- FTO is big issue
- Negotiating FTO is difficult and costly
- Markets for IP disappear
Industry Solutions

- Firms have used mergers to obtain FTO
- Private and public firms are creating their own research platforms
- Industry becomes concentrated through mergers
Are industry solutions working?

- Worked for first generation
  - Although best traits were not combined
- Less evidence for Second generation
  - Commercialization VEC are rare
  - FTO will get worse more pieces of IP - (greek land?)
  - Concentration will get worse
  - Food / life science partnerships require selling
Other solutions?

- I’m all ears!