
Systems Competition and Seed Markets

Diana L. Moss
Vice President and Senior Fellow
American Antitrust Institute

**American Antitrust Institute Symposium on Systems
Competition**
June 17, 2009 - Washington, DC

Overview

- Thinking about seed systems
- Seed industry characteristics
- Markets for genetic traits and traited seed
- Market linkage and access
- “Systemization” strategies
- Examples from industry developments
- Key policy issues

Thinking About Seed Systems

- The combination of Monsanto and Delta and Pine Land (cotton) would “. . .provide a complete platform of cutting-edge seed technologies to our global farmer customer base for years to come.”

Source: “Monsanto Company to Acquire Delta and Pine Land Company for \$1.5 Billion in Cash,” Monsanto Press Release (August 15, 2006)

- “A new gene is worthless without a quality seed base to put it in and the infrastructure to deliver it.”

Source: “The Agbiotech and Seed Industry, “Furman Seltz LLC, Investment Report (May 1998)

Seed Industry Characteristics

- Two complementary markets
 - Genetic traits – herbicide tolerance, insecticide resistance
 - Traited seed – genetically modified seeds including corn, cotton, soybeans
- Joint ventures for development and cross-licensing
 - within markets (e.g., genetic traits)
 - across markets (e.g., genetic traits and seeds)
- Significant vertical integration by large agriculture biotechnology firms
- *Rivalry is for the introduction of new genetic traits for ultimate commercialization in traited seed*

Seed Industry Components

Genetic Traits Market
(agricultural biotechnology companies)

Market Linkage
(Access for rivals)

Traited Seed Market
(seed companies)

Market Structure - Genetic Traits

- Traits
 - Insect resistance
 - Herbicide tolerance
- High barriers to entry
 - R&D-intensive, long development lead times
 - Patented technology
- Monsanto dominant firm with smaller rivals (DuPont-Pioneer, Syngenta, Dow, Bayer)
 - Soybeans: 98% in herbicide tolerance
 - Corn: 93–99% in herbicide tolerance and/or insect resistance
 - Cotton: 95–100% in herbicide tolerance and/or insect resistance
- *Concentration ranging from ~ 8,600 HHI – 10,000 HHI across crop traits*

Market Structure - Traited Seed

- Seeds that express
 - herbicide tolerance
 - insect resistance
 - Both through “stacking” of multiple genes
- High barriers to entry
 - R&D-intensive, long lead times for breeding programs
 - Patented technology
 - Regulatory hurdles, brand loyalty
- Monsanto dominant firm with +60% shares in licensed germplasm for soybeans, corn, and cotton
- *Highly concentrated markets in licensed germplasm*
 - *Soybeans: ~ 4,500 HHI*
 - *Corn: ~ 4,800 HHI*
 - *Cotton: ~ 3,300 HHI*

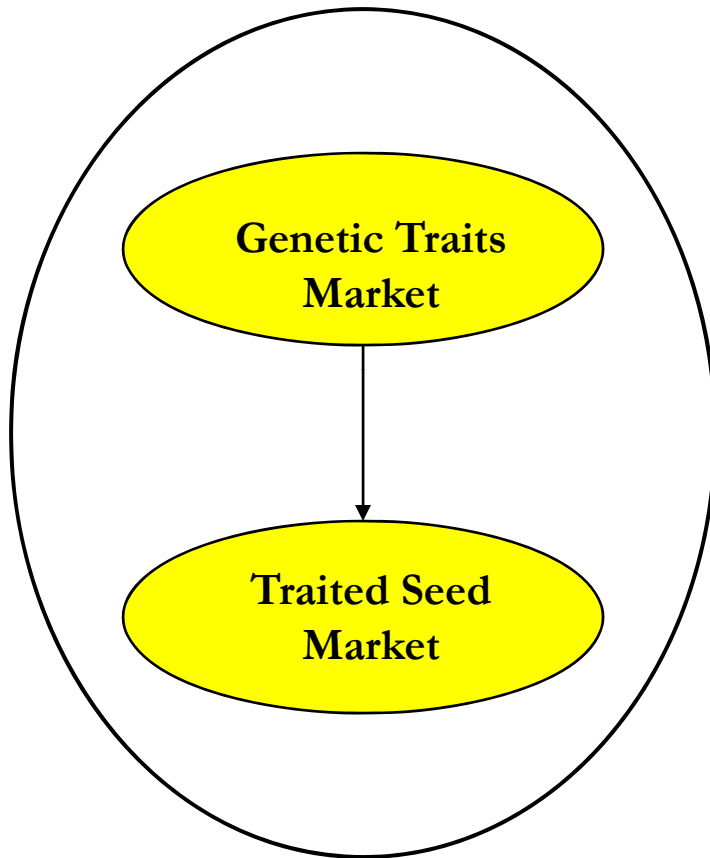
Market Linkage and Access

- Access to technology
 - Licensing of rivals' traits
 - Enables gene “stacking” to offer suites of genetic characteristics to seed companies
- Access to distribution channel
 - Broader seed (germplasm) market, not just own branded seed businesses
 - Independent seed companies with large germplasm holdings

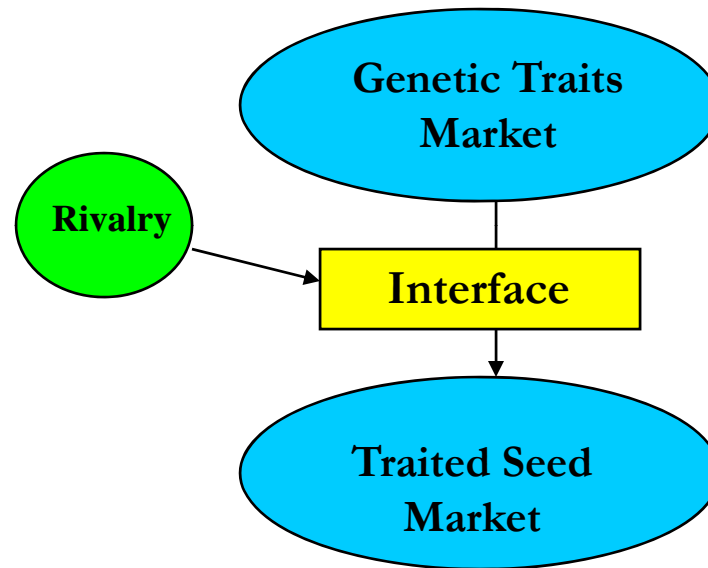
Market Linkage and Access - Implications

- No access – promotes “closed” structure impervious to competition
- Access – promotes “open” structure and competition

Open vs. Closed Seed System



Closed System
(Impervious to Competition)

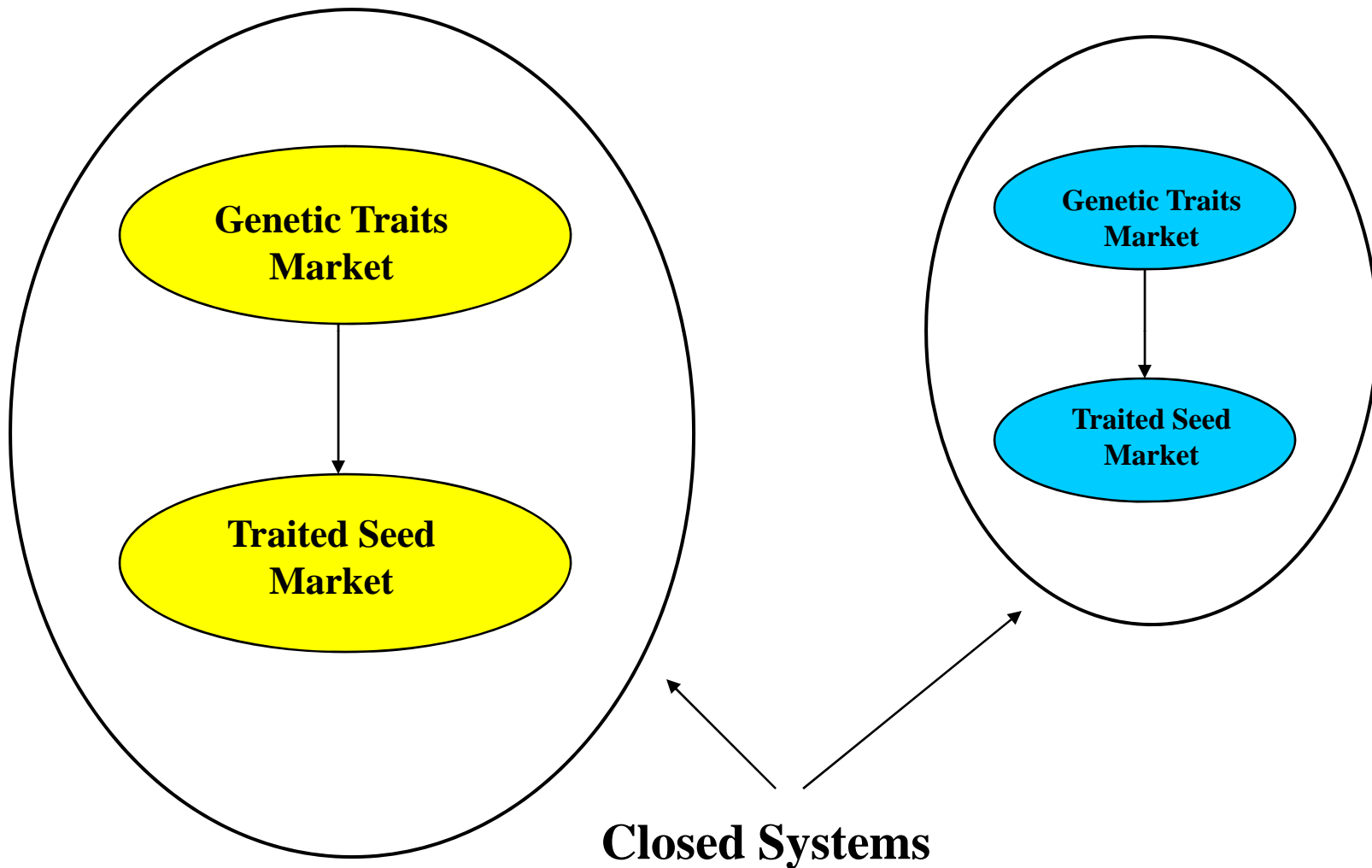


Open System
(Promotes Competition)

Market Linkage and Access - Trend Toward “Systemization”

- Process by which a closed system is created and/or maintained
- Multiple competitive strategies for promoting
- Monsanto dominates corn, cotton, and soybean seed systems due to its sheer size and integration
- Adverse implications for competition and consumers

Two Closed Seed Systems



Systemization Strategies – Restrictive Licensing

- Restrictions exclude rival traits developers from access to needed technology
- Multiple licensing provisions include, among others:
 - Anti-gene stacking
 - Bundled incentives
 - Anti-seed saving
 - Technology fees
- Rampant patent infringement cases
- Numerous Section 2 cases

Systemization Strategies – M&A and JVs

- Acquisitions of independent seed companies
 - Removes independent seed companies as important distribution channel for rival traits developers
 - Monsanto acquired 35 seed companies between 1996 - 2008 (a substantial portion of the total), 70% of which occurred from 2004 – 2008
- Exclusive cross-licensing joint ventures between rival traits developers can potentially diminish competition

Examples – Merger of Monsanto and Delta and Pine Land (2006)

- Vertical merger that effectively removed DPL as an independent seed company from the market for traited cotton seed
 - Created a single, large cotton system
 - Monsanto with 96% share of cotton traits
 - DPL with 50% share of traited cotton
 - DOJ consent agreement created a small and inadequate competing “system” through
 - Seed asset divestitures
 - Germplasm licensing requirements
 - Removal of anti-stacking provisions in Monsanto licenses
-

Examples - Monsanto-Dow “SmartStax” Agreement

- Cross-licensing agreement for genetic traits for corn in an 8-gene stack
 - Multiple traits provide dual modes of action
 - Obviates need for EPA refuge requirements to deal with growing bug resistance
- Could prevent Dow from out-licensing its Herculex insecticide resistance trait to rivals
 - Makes it impossible for rivals to stack Herculex with their traits
 - Prevents development of alternative system to Monsanto-Dow stacked product

Key Policy Issues

■ Legal issues

- ❑ Intellectual property law and antitrust law at loggerheads
- ❑ Intellectual property law grappling badly with field of use restrictions for traits licensing

■ Public policy issues

- ❑ Food safety and security tied to dominance of a single firm
- ❑ Adverse implications for conventional and organic seeds

■ Antitrust policy issues

- ❑ Should markets be defined as individual complements or as complete system?
- ❑ When and how to promote access vs. competition between systems?
- ❑ Badly needed ‘retrospective’ on effects of successive M&A in seed markets