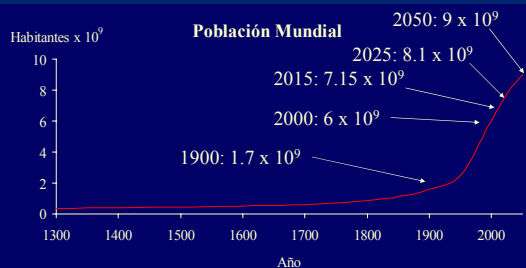


# La Industria Semillera Internacional

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## Introducción

- One of the most fundamental goals of agriculture is the production of food, feed and fiber for an increasing number of people in the world .



## Introducción

¿cómo responder a esta creciente demanda?

- Desarrollo de nuevas tecnologías
  - Mejoramiento de las variedades cultivadas → 50%
  - Establecimiento
  - Riego
  - Fertilización
  - Protección de cultivos
  - Poscosecha
  - etc.

## Introducción

Breeding objectives:

- Yield
- Quality
- Disease and pest resistance
- Performance under stress.

## Introducción

- Economic development originate new necessities.



## Introducción

- Economic development originate new necessities(2).



→ se estima que EUA las hortalizas y ornamentales representan, respectivamente, un 20 y 10% del valor total de su agricultura.

## Introducción

- Seeds have become more than a fundamental input of the agriculture, nowadays seeds are valuable organisms, able to transport some of the most recent technologies



## Mercado Internacional de Semillas.

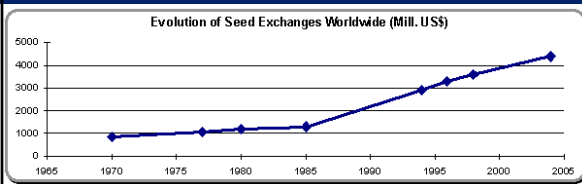
Estimated size of the domestic market for seed in selected countries (in USD million) (updated in March 2007).

País	US\$ x 10 <sup>6</sup>	País	US\$ x 10 <sup>6</sup>
1. USA	7,000	11. Russian Federation	500
2. China	4,500	12. Korea	400
3. Japan	2,500	13. Australia	400
4. France	1,930	14. México	350
5. Brazil	1,500	15. Taiwan	300
6. Germany	1,000	16. Spain	300
7. India	1,300	17. Poland	260
8. Argentina	930	18. UK	257
9. Italia	780	19. Turkey	250
10. Canada	550	20. South Africa	250

Fuente: ISF, 2007.

Total: ~ US\$30 billion

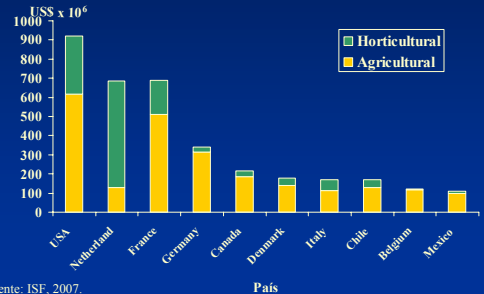
## Globalización de la Industria Semillera



Fuente: ISF, 2007

## Globalización de la Industria Semillera

Seed Exports (FOB) of Selected Countries, 2005 (in USD million)



Fuente: ISF, 2007.

## Globalización de la Industria Semillera

Cuadro 3. Exportación mundial de semillas por cultivo.

Cultivo	Exportación de semillas	
	US\$ x 10 <sup>6</sup>	Participación
Vegetables and Flowers	1.150	32%
Maize	530	14%
Herbage crops	427	12%
Potato	400	11%
Beet	308	8%
Wheat	75	2%
Other agricultural crops	750	21%
<b>Total</b>	<b>3.640</b>	

Fuente: ISF, 2002

## Globalización de la Industria Semillera

Causes for globalization:

### General

- Political, economic and technical changes

### Specific

- Counter-season
- Agro-climatic zones
- Regional and international organizations concerned with seed trade
- Multinational companies

## Globalización de la Industria Semillera

Organizations concerned with seed trade :

- **International Seed Federation (ISF)** = International Seed Trade Federation + International Association of Plant Breeders.
- **International Seed Testing Association (ISTA)**
- **Association of Official Seed Analysts (AOSA)**
- **International Union for the Protection of New Varieties of Plants (UPOV)**
- **Federación Latinoamericana de Asociaciones de Semillas (FELAS)**
- **Asociación Nacional de Productores de Semillas (ANPROS)**

## Globalización de la Industria Semillera

Some limitations to globalization:

### Technical commercial limitations

#### Regulatory limitations

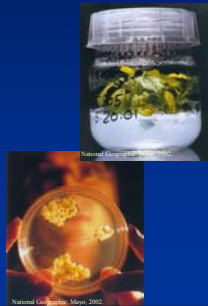
- Phytosanitary regulations
- Prohibition to trade seed treated with some products
- Prohibition to trade genetically modified organisms (GMO) products
- Lack of protection of intellectual property rights in some countries

## Impacto de las nuevas tecnologías

### Breeding and creation of new varieties

- Increase and better use of variability

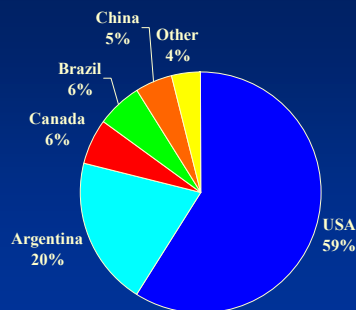
• Breeding of new varieties has had important advances, manifested by reduction of the time required and a better precision in obtaining target characteristics, such as larger yields, resistances to diseases and insects, better adaptation to stress conditions, herbicide resistance, better compositional traits of the products, improved post-harvest performance, etc .



## Impacto de las nuevas tecnologías

- The market for biotech seed traits (herbicide tolerance and insect resistance) has shot up from \$280 million in 1996 to \$4,700 million in 2004, a 17-fold increase.

Where were GM crops grown in 2004?



### Pioneer/Dupont Product Offerings USA, 2005

Seed Product	Total # of Seed Varieties	# with Biotech Traits	Percent
Maize/corn	298	150	50%
Soybean	107	89	83%
Canola	9	4	44%

## Impacto de las nuevas tecnologías

### Production and seed technology

- The modification of a specific trait could affect either seed quality or the performance of the variety
- Generation of new techniques to control fertility in species in which natural sterility is not known or is useless.
- New techniques to control germination of second generation of seeds.

## Impacto de las nuevas tecnologías

- Seed technology rises as an important discipline, including selection, conditioning and treatments of seeds to improve their performance as a propagation unit.
  - Seed coating
  - “Priming”
  - Chemical or biological protection of seeds
  - Addition of growth regulators to seeds
  - New techniques for seed evaluation
  - etc.



## Funciones y estructura de la industria

Some functions of the industry:

- Plant breeding, including genetic research and cultivar assessment,
- Multiplication and seed production, either in companies own dependences or by producers,
- Processing, including drying, storage, packaging and seed treatments,
- Marketing
- Legislative control, seed certification and testing,
- Extension activities.

## Funciones y estructura de la industria

- The Industry is organized in public and private entities, which assume these different functions, with the objective of accomplishing the general roles of *research*, *production*, *quality control*, and *marketing*.

## Funciones y estructura de la industria

- Nowadays the seed industry is characterized by the presence of huge multinational companies, most of them North American, European and Japanese. They have integrated vertically and participate in all the functions of the industry.

### Principales fusiones y adquisiciones de empresas de semillas (1999)



Seed Company	Subsidiaries/Acquisitions
Monsanto (USA)	<ul style="list-style-type: none"> <li>• Seminis</li> <li>• Emergent Genetics</li> <li>• American Seeds Inc.</li> <li>• Charrel Bio Corp.</li> <li>• Crow's Hybrid Corn</li> <li>• Midwest Seed Genetics</li> <li>• Wilson Seeds</li> <li>• NC+Hybrids</li> <li>• Advanta Canola Seeds</li> <li>• Interstate Canola Seeds</li> <li>• Asgrow (soybean &amp; corn)</li> <li>• Holden's Foundation</li> <li>• Jacob Hartz</li> <li>• Hybritech</li> <li>• Calgene</li> <li>• Agracetus</li> <li>• Plant Genetics Inc.</li> <li>• Ameri-Can Pedigreed</li> <li>• Monsoy (Brazil)</li> <li>• First Line Seeds (Canada)</li> <li>• Plant Breeding Intl. (UK)</li> <li>• Agroceres (Brazil)</li> <li>• Cargill's intl. seed division</li> <li>• Dekalb Genetics (USA)</li> <li>• Custom Farm Seed</li> <li>• Sencako (South Africa)</li> </ul>

World's Top 10 Seed Companies + 1	
Company	2004 seed sales (US Millions)
1. <b>Monsanto (US) + Seminis</b> (acquired by Monsanto 3/05)	\$2,277 <sup>1</sup> + \$526 <i>pro forma</i> = \$2,803
2. <b>Dupont/Pioneer (US)</b>	\$2,600
3. <b>Syngenta (Switzerland)</b>	\$1,239
4. <b>Groupe Limagrain (France)</b>	\$1,044 <sup>2</sup>
5. <b>KWS AG (Germany)</b>	\$622 <sup>3</sup>
6. <b>Land O' Lakes (US)</b>	\$538 <sup>4</sup>
7. <b>Sakata (Japan)</b>	\$416 <sup>5</sup>
8. <b>Bayer Crop Science (Germany)</b>	\$387 <sup>6</sup>
9. <b>Taikii (Japan)</b>	\$366 <sup>7</sup>
10. <b>DLF-Trifolium (Denmark)</b>	\$320 <sup>8</sup>
11. <b>Delta &amp; Pine Land (US)</b>	\$315

## Funciones y estructura de la industria

• New concept: "**Life Science Companies**". This companies, based in genomics (study of genome function and structures), biotechnology and chemistry, will generate agricultural, pharmaceutical and agrochemicals products, which will be introduced to the production process by the seed.