International Conference
on "Life Cycle Assesment in the Agri-food Sector"

SOYBEAN PRODUCTION IN ARGENTINA AND SOUTH AMERICA: NEW TECHNOLOGIES, AGRICULTURAL ENVIRONMENT AND SOCIOECONOMIC IMPACTS. THE IMPLICATIONS FOR THE FUTURE.

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About this presentation:

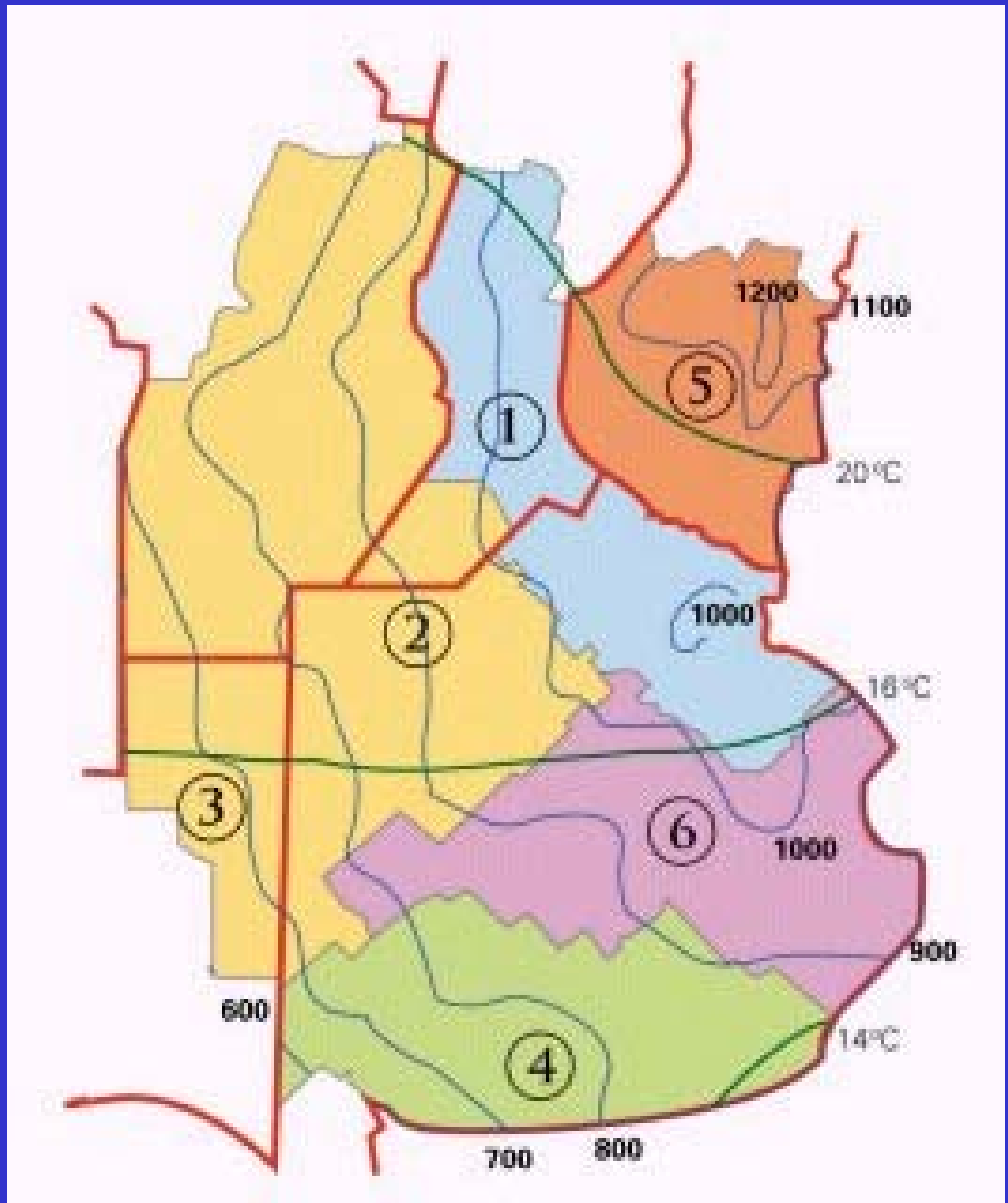
- **Agroproductive changing in *Las Pampas* (Argentina) during the nineties**
- **The expansion of the agroexportation model in South America**
- **Technological adoption and Inputs Application**
- **Social and Ecological Issues**
- **Indicators of Agro-Ecological Sustainability**

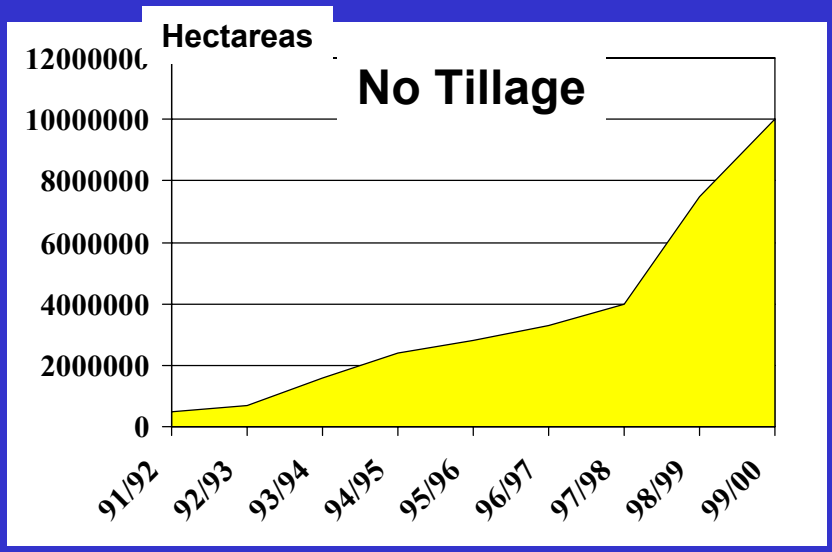
The Pampas – One of the most agroproductive areas of the world

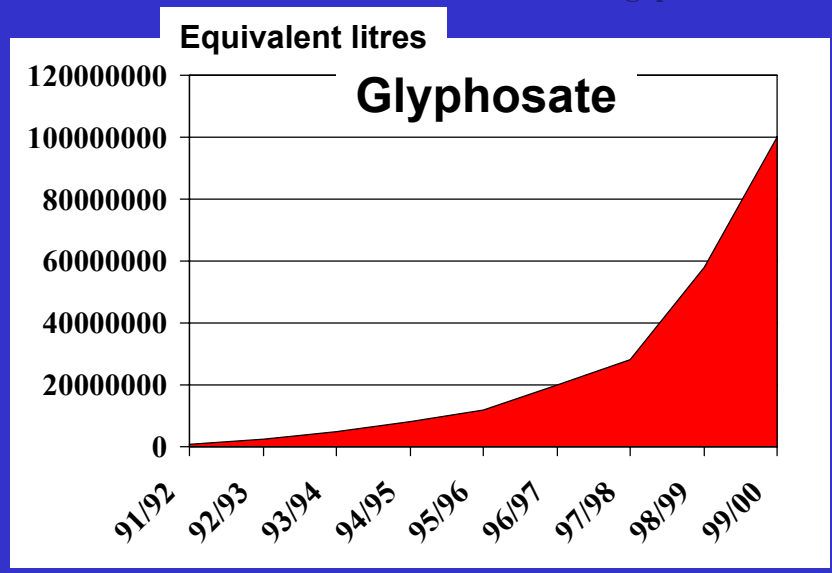
1) Rolling Pampas
2) Subhumid Central Pampas
3) Semiarid Central Pampas
4) Southern Pampas
5) Mesopotamian Pampas
6) Flooding Pampas

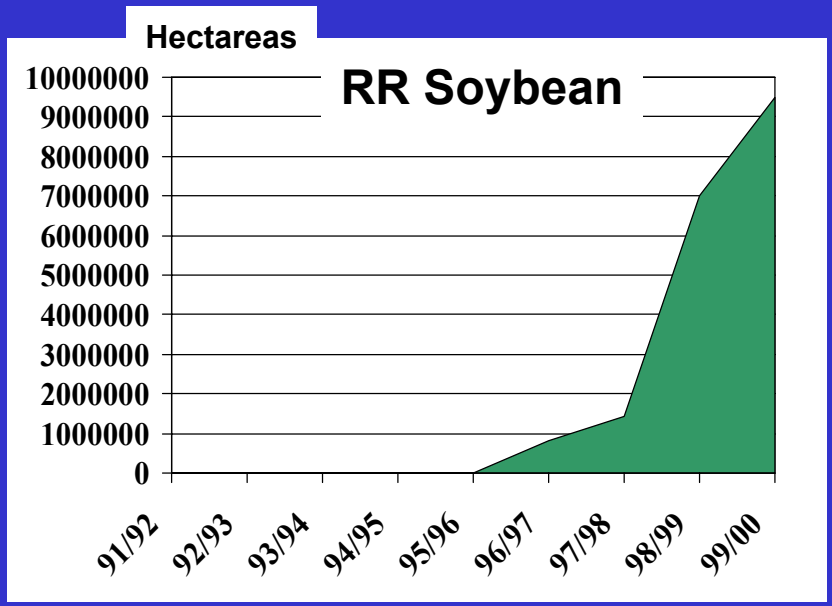
In Blue: Isohyets (mm/year)

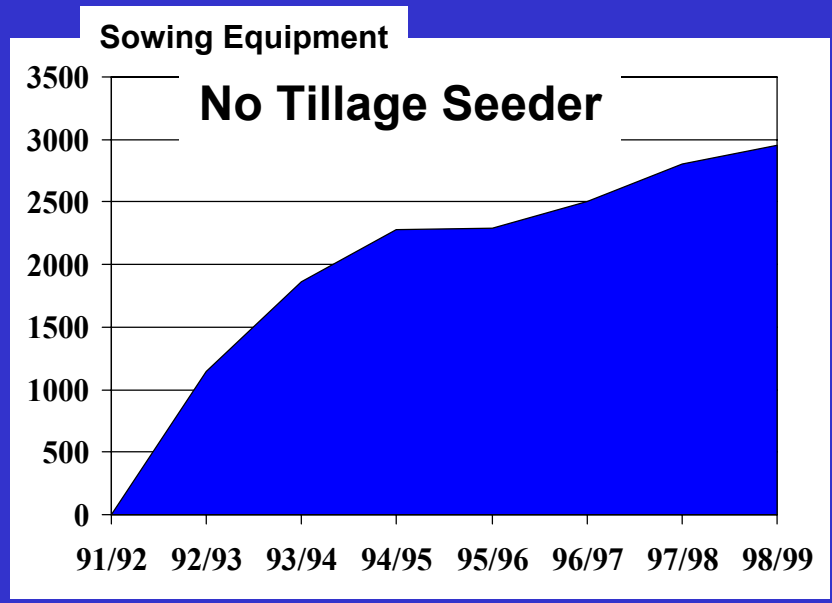
In green: Annual Temperature Degree Centigrade











Source: SAGPyA, Aapresid, Pengue, 2000.

Transgenic soybean under No Tillage system.

Source of picture: Pengue, W. CULTIVOS TRANSGENICOS, HACIA DONDE VAMOS, UNESCO, 200O, Bs.As.

Roundup Ready Soybean on Corn stubble. Tipical crop rotation at Pampas.

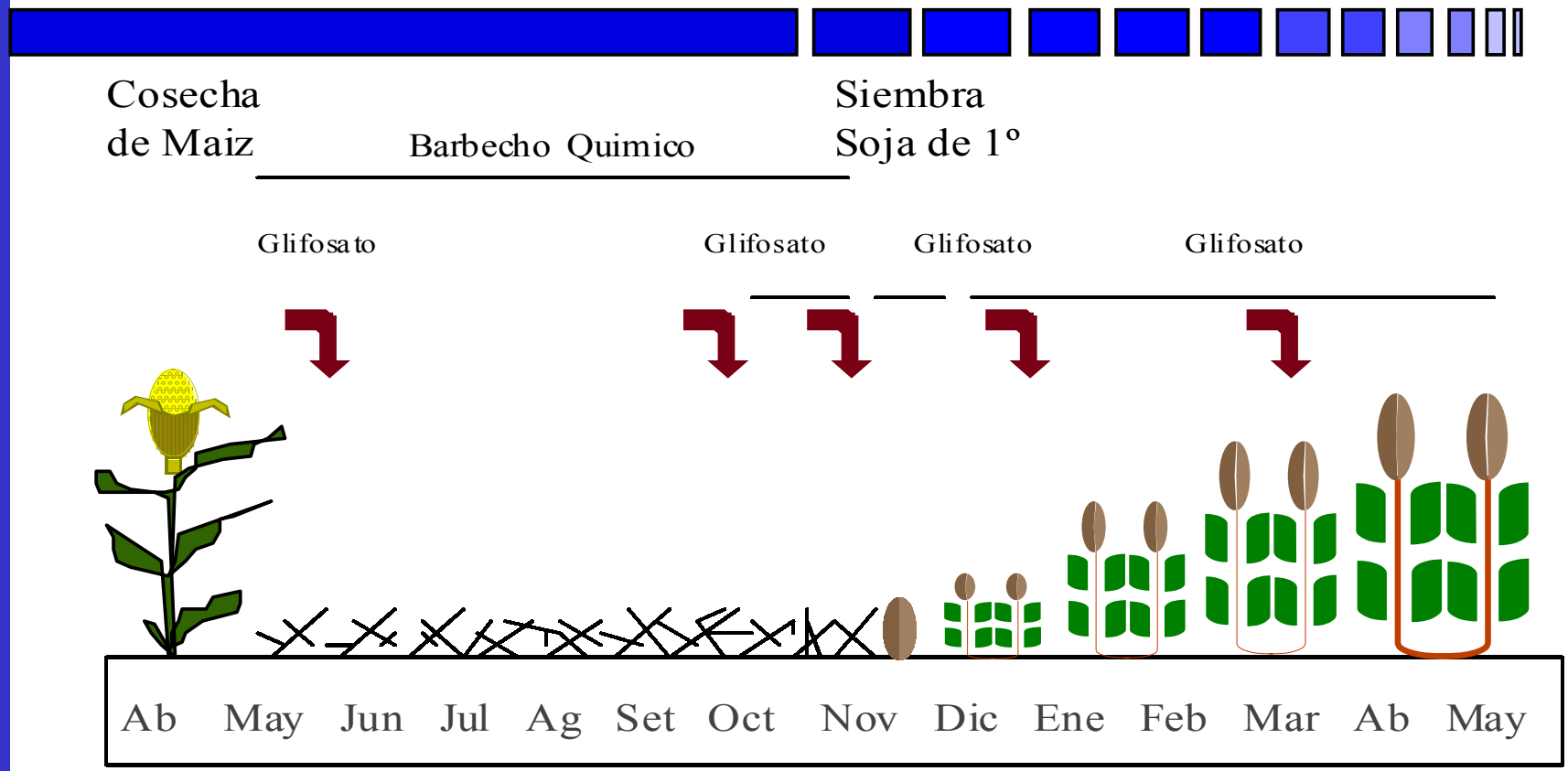
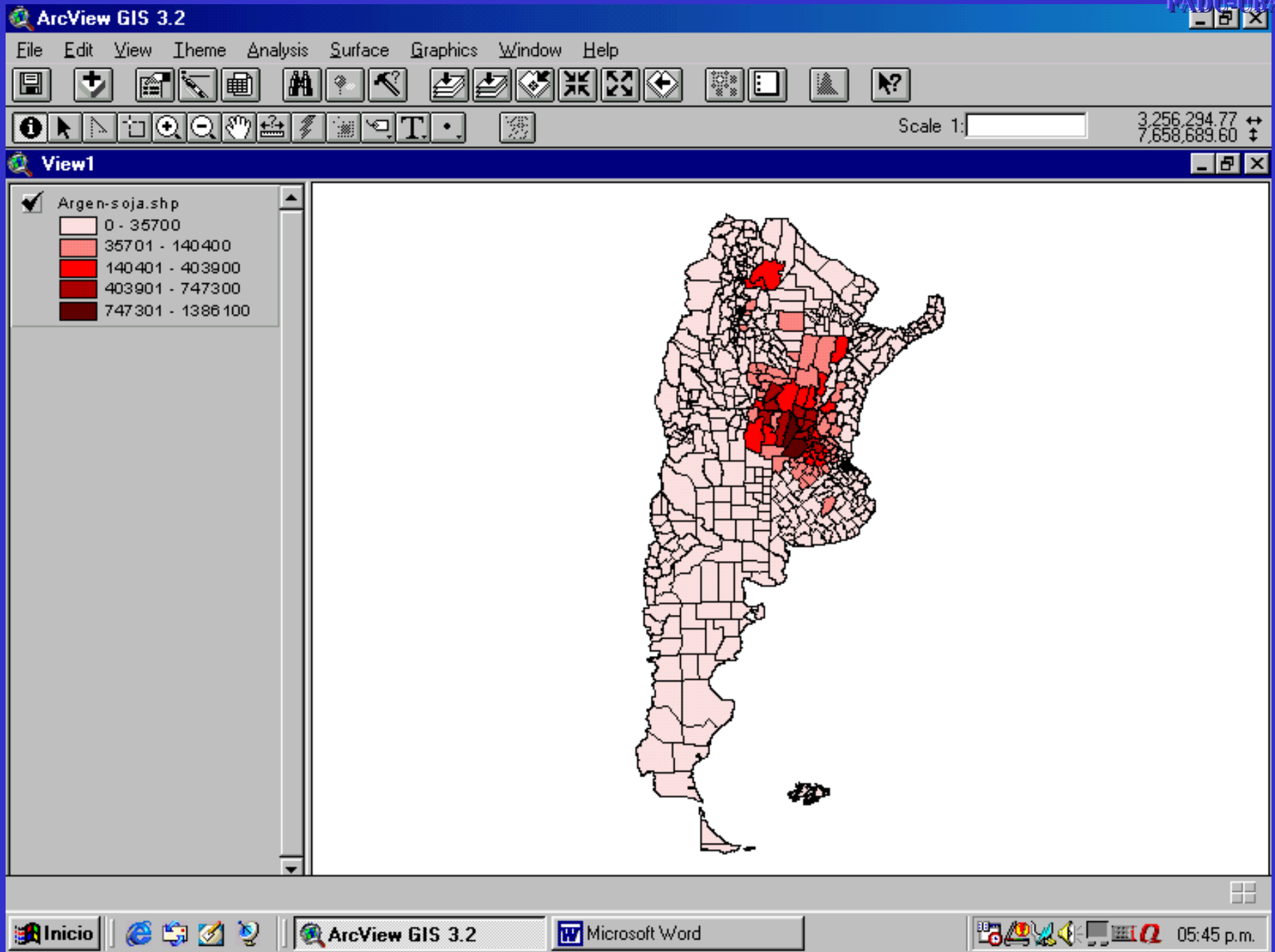


Diagrama Nº 5

Fuente: Elaboración propia.

Source of picture: Pengue, W. CULTIVOS TRANSGENICOS, HACIA DONDE VAMOS, UNESCO, 200O, Bs.As.

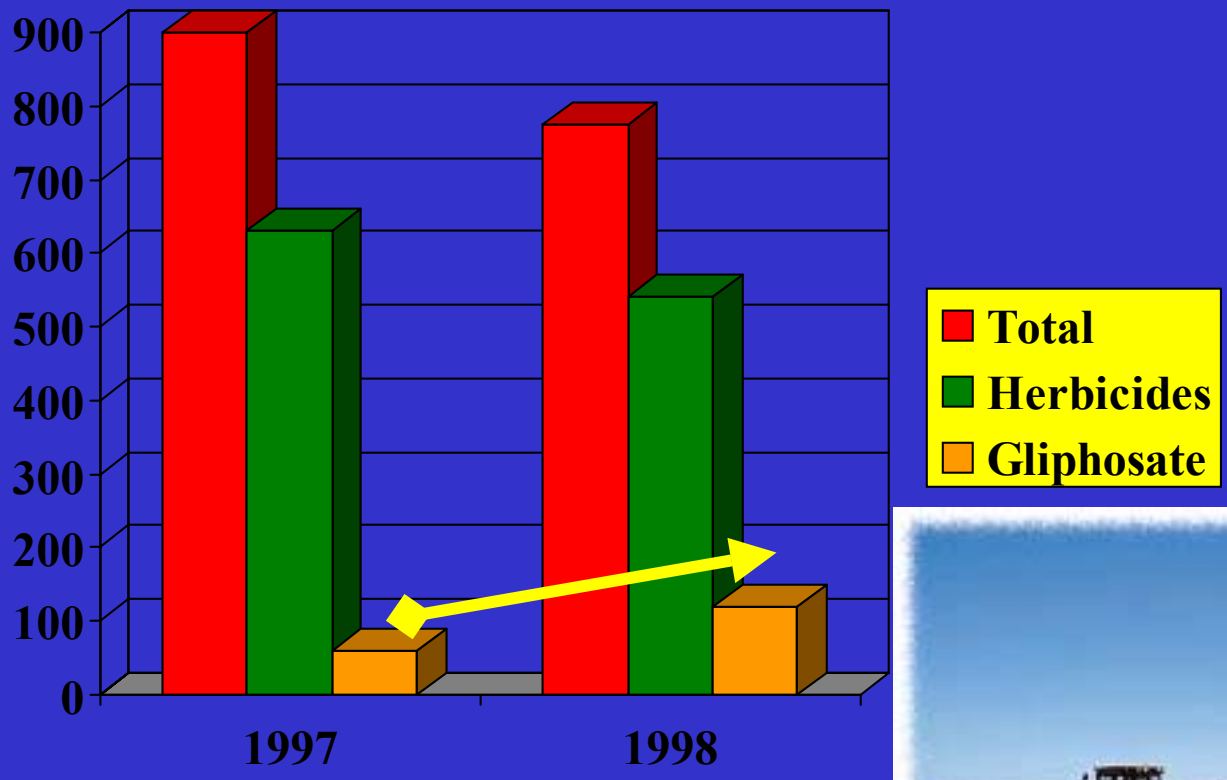
Soybean - 1998



Sorgo de Alepo (Sorghum halepensis) - a weed - under glyphosate treatment on RR soybean field

Source of picture: Pengue, W. CULTIVOS TRANSGENICOS, HACIA DONDE VAMOS, UNESCO, 200O, Bs.As.

Trends in the agroquemical market in Argentina
millions u$s

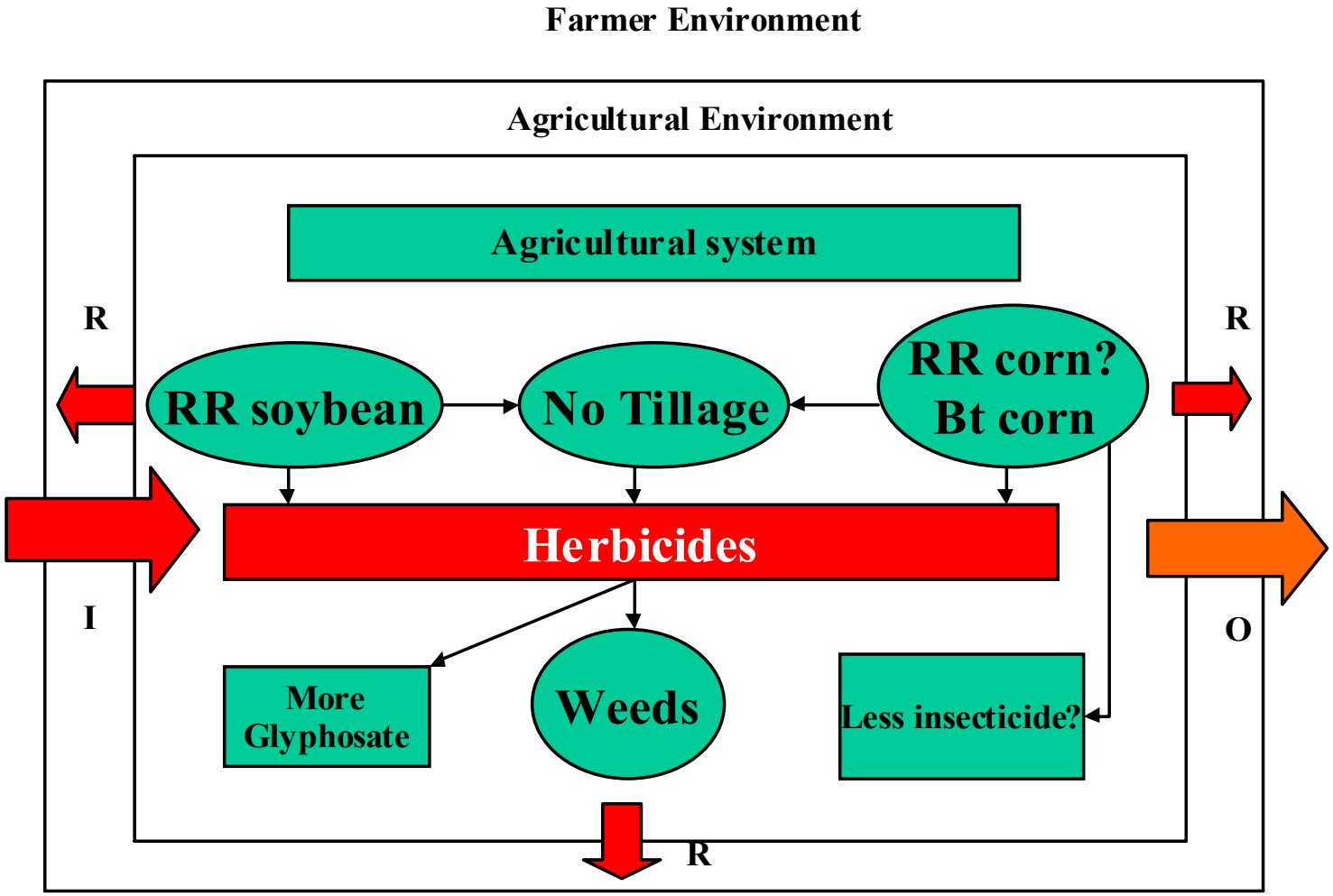


Source: CASAFE, Pengue, 2000.

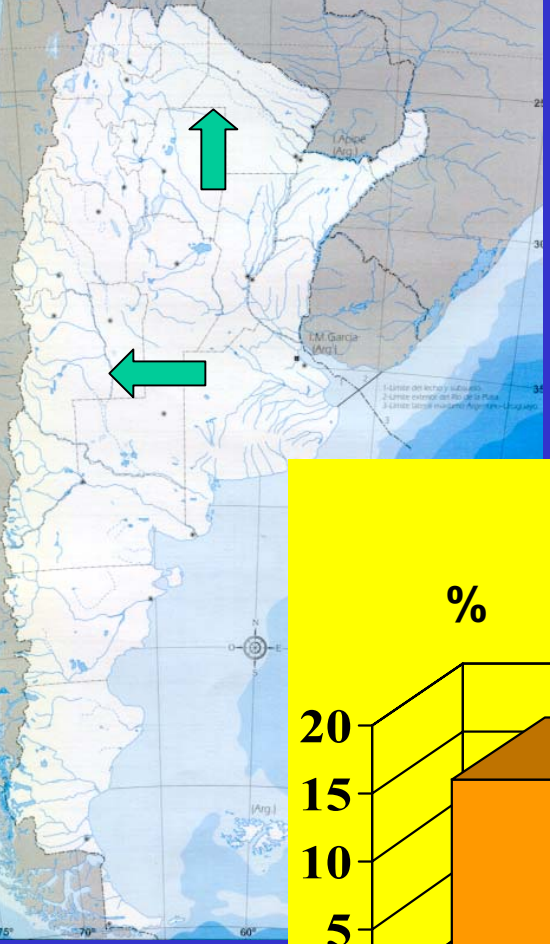
Comparative analysis of pesticides consumption and percentage of fauna species under extintion risk during the period 1968 – 1988 in countries that differ in their agricultural intensification level

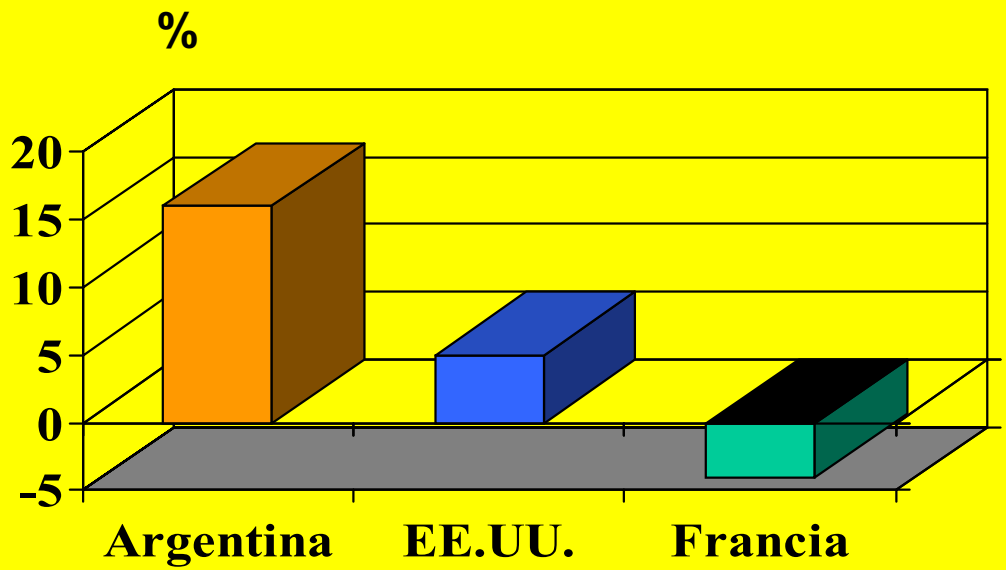
Country	Insecticide Fungicide Kg Ac/ha/year	Herbicide Kg Ac/ha/year	Mammals Under extintion risk	Birds Under extintion risk
ARGENTINA	0.22	0.18	10.2	1.9
United States of North America	1.05	0.92	10.5	7.2
France	2.98	2.14	52.2	39.8

Source: W.R.I (1991)



Source: Pengue, W. 2001.





New Lands being incorporated to the agriculture activities.

Source of picture: Pengue, W. CULTIVOS TRANSGENICOS, HACIA DONDE VAMOS, UNESCO, 200O, Bs.As.

Socioeconomic Aspects

Disminución de las Explotaciones Agropecuarias por Grandes Regiones. Argentina.

Censo Año	Total País	**Pampeana**	NEA	NOA	Cuyo	Patagonia
1988	421.221	**196.254**	85.249	72.183	46.222	21.313
2002	317.816	**136.345**	68.332	63.848	32.541	16.750
Diferencia %	**- 24,5**	**- 30,5**	**- 19,8**	**- 11,5**	**- 29,6**	**- 21,4**

Fuente: Elaboración Propia en base a datos del Censo Nacional Agropecuario 2002, INDEC.

Participación relativa de productores por Grandes Regiones. Argentina.

Censo Año		**Pampeana**	NEA	NOA	Cuyo	Patagonia
1988		**46,6**	20,2	17,1	11,0	5,1
2002		**42,9**	21,5	20,1	10,2	5,3
Diferencia %		**- 8,6**	5,9	14,7	- 7,2	4,0

Fuente: Elaboración Propia en base a datos del Censo Nacional Agropecuario 2002, INDEC.

Soybean expansion during 1996/97 – 2001/2002

	Rice	Corn	Sunflower	Wheat	Soybean
1996/97	226.573	4.153.400	3.119.750	7.366.850	6.669.500
2001/02	126.519	3.064.276	2.050.365	7.108.900	11.639.240
Porcentual Difference	(44,1%)	(26,2%)	(34,2%)	(3,5%)	74,5%

Fuente: INDEC, 2002.

Regional Impact of the expantion of Transgenic Soybean Model

Energy productivity and fossil energy consumption in the Argentine Pampas
Comparision of trends among ecologically homogeneous areas

	Energy Productivity Gj/ha/year			Fossil Energy Consumption GJ/ha/year		
	1960	1988	1996	**1960**	**1988**	**1996**
Regional Average The Pampas	6.40	13.45	22.16	**1.30**	**1.68**	**3.31**
Rolling Pampas	9.03	24.11	31.92	**1.27**	**1.95**	**3.79**
Central Subhumid	6.39	14.40	25.59	**1.88**	**2.00**	**3.81**
Central Semiarid	2.75	4.33	8.43	**1.19**	**1.88**	**2.68**
Southern Pampas	5.44	11.23	19.48	**1.15**	**1.78**	**3.12**
Flooding Pampas	3.48	4.19	10.91	**0.56**	**0.50**	**1.43**
Mesopotamian	3.21	3.42	13.92	**0.56**	**051**	**1.86**

Source: National Program on Agro-Environmental Management, 2002.

Estimation of a coefficient of habitat intervention in the Argentine Pampas and its ecologically homogeneous areas during the period 1960 - 2000

	1960	1988	1996
Regional Average	0.02	0.03	0.14
Rolling Pampas	0.03	0.04	0.30
Central Subhumid	0.02	0.03	0.15
Central Semiarid	0.02	0.03	0.15
Southern Pampas	0.02	0.02	0.03
Flooding Pampas	0.01	0.01	0.02
Mesopotamian	0.01	0.06	0.14

Source: National Program on Agro-Environmental Management, INTA, 2002.

Estimation of the relative soil erosion in the Argentina Pampas during the period 1960 - 2000

	1960	1988	1996
Regional Average	0.11	0.09	0.09
Rolling Pampas	0.08	0.08	0.08
Central Subhumid	0.16	0.11	0.12
Central Semiarid	0.21	0.20	0.26
Southern Pampas	0.13	0.11	0.10
Flooding Pampas	0.06	0.03	0.05
Mesopotamian	0.11	0.09	0.10

Source: National Program on Agro-Environmental Management, INTA, 2002.

Some final comments:

Argentina, and the Pampas specially are going on intensification practices

The "engine" of this transformation are No Tillage System and OMGs crops

Transgenic soybean is producing an important change of Agricultural Landscape and advancing strongly on agricultural frontier.

There are an important exportation of nutrients without recovering nor reposition.

There are social and environmental impacts but with important increasing of Productivity and Production.

No Tillage System allowed to protect the soil and reduce erosion but...

To reduce erosion the country increased deeply de consume of herbicides

Source of picture: Cultivos Transgénicos, Hacia dónde vamos.

“ The GAUCHO “

Tipical man of *The Pampas*

Thank You Very Much
Muchisimas Gracias