

Sustainable Livestock Development Restoring Value to Grasslands

"Grassland development
& integration with
cropping systems in
Latin America"

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Intensification and expansion of the agricultural border



Some regional differences in Latin America

- Northern Countries

Mexico, Colombia, Venezuela, Ecuador, Perú.

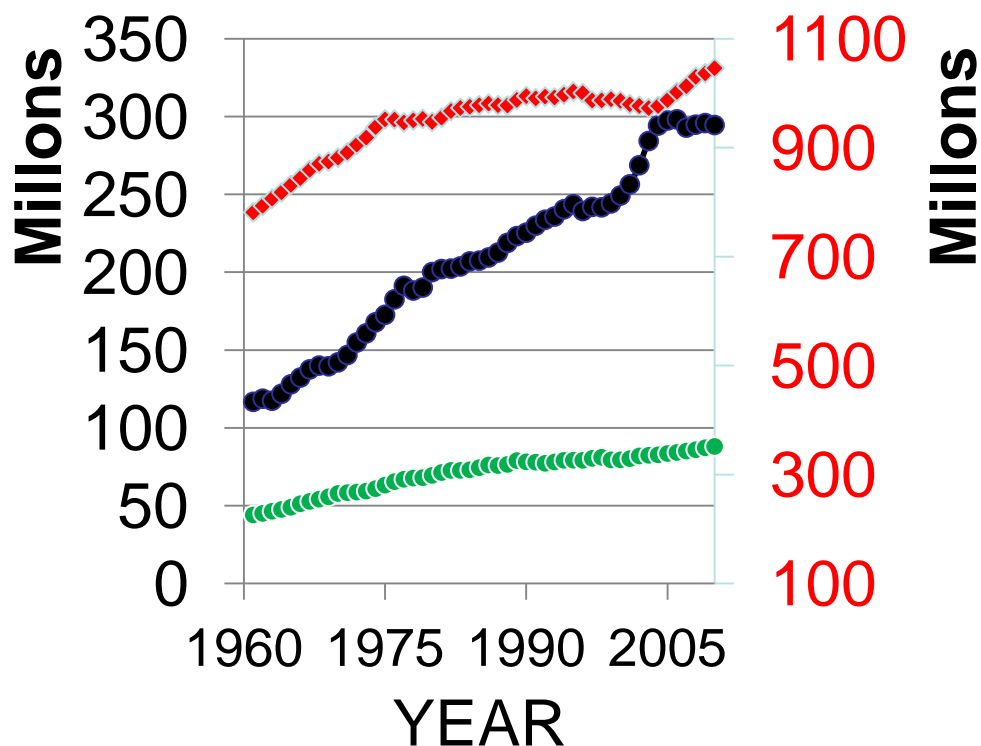
- Southern Cone Countries

Brazil, Bolivia, Chile, Argentina, Paraguay, Uruguay.





Cattle stock in Latin America & World in the last 50 years .



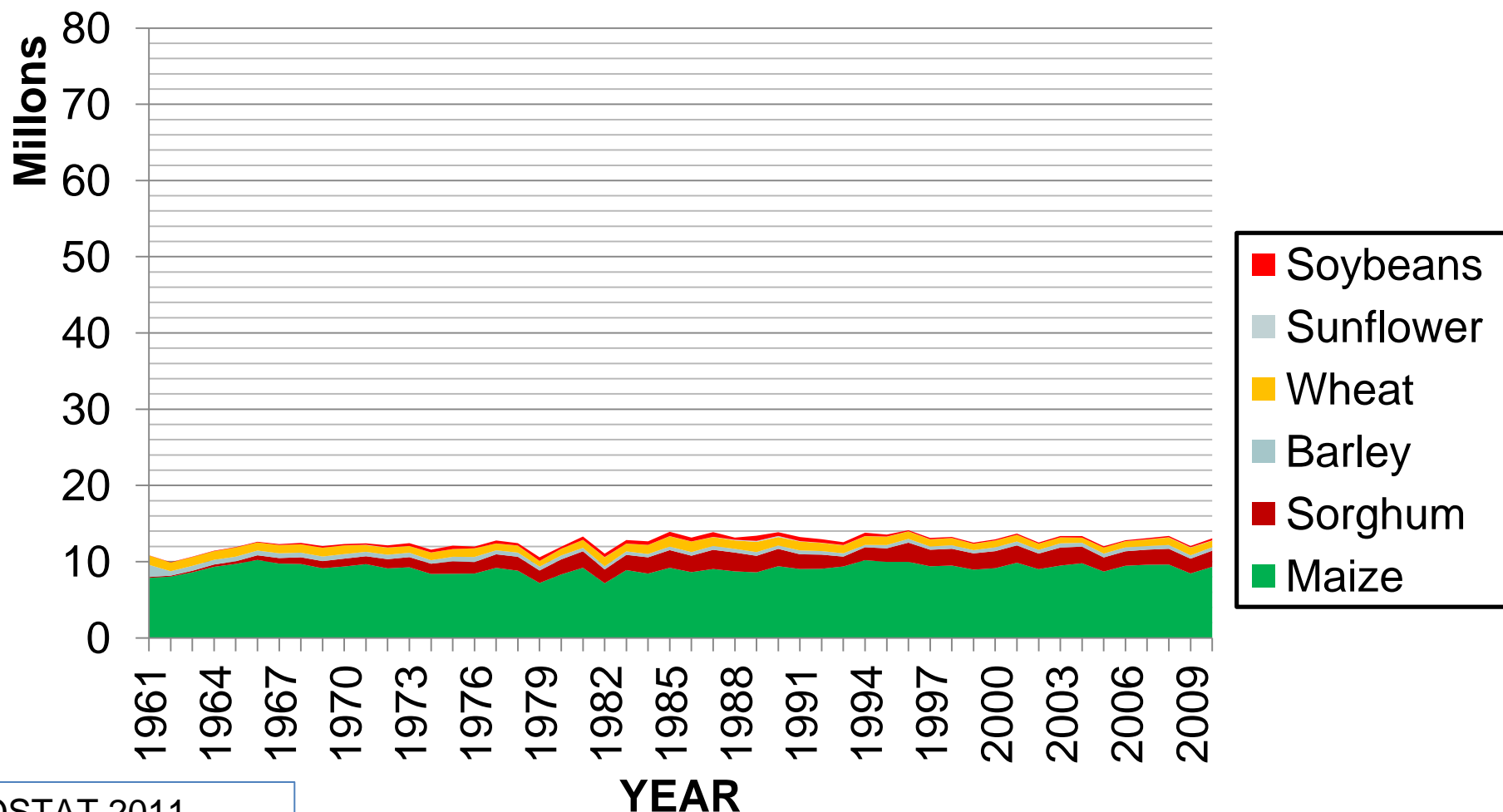
- Southern Cone
- Northern LA
- ◆ World



Agricultural Expansion and Intensification

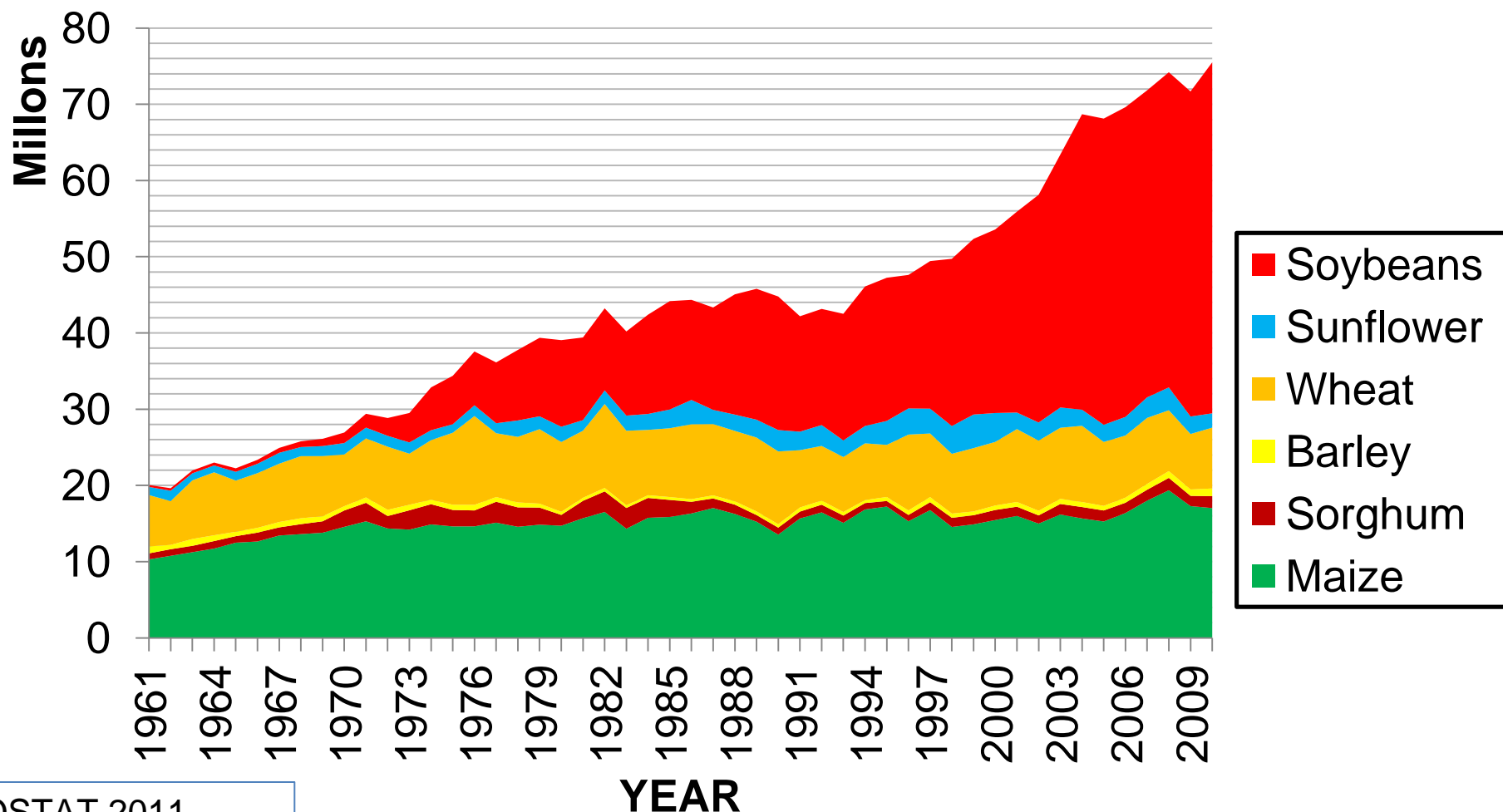
Area of Rainfed Grain Crops in the Northern Countries

(Mexico, Colombia, Venezuela, Ecuador, Peru)

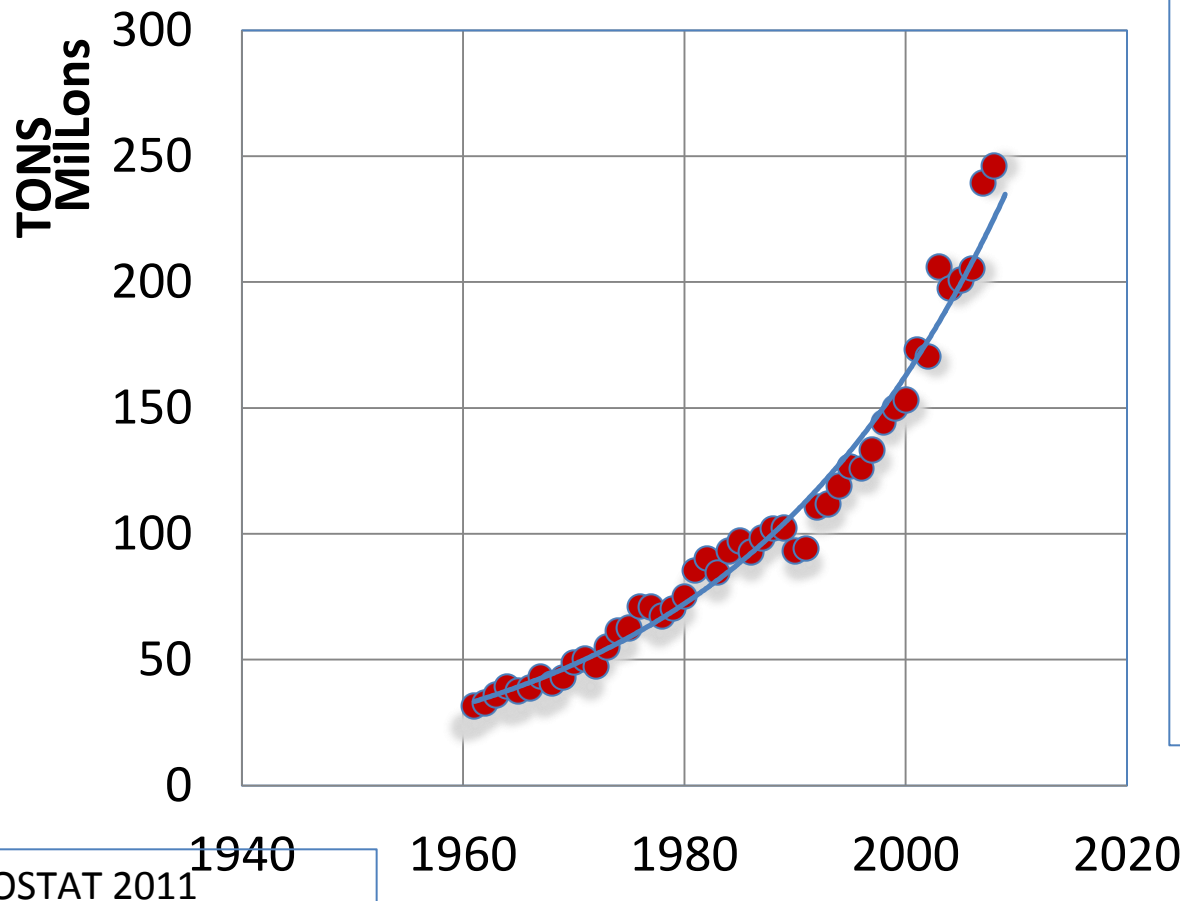


Area of Rainfed Grain Crops in Southern Cone Countries

Argentina, Bolivia, Brazil, Chile, Paraguay, Uruguay

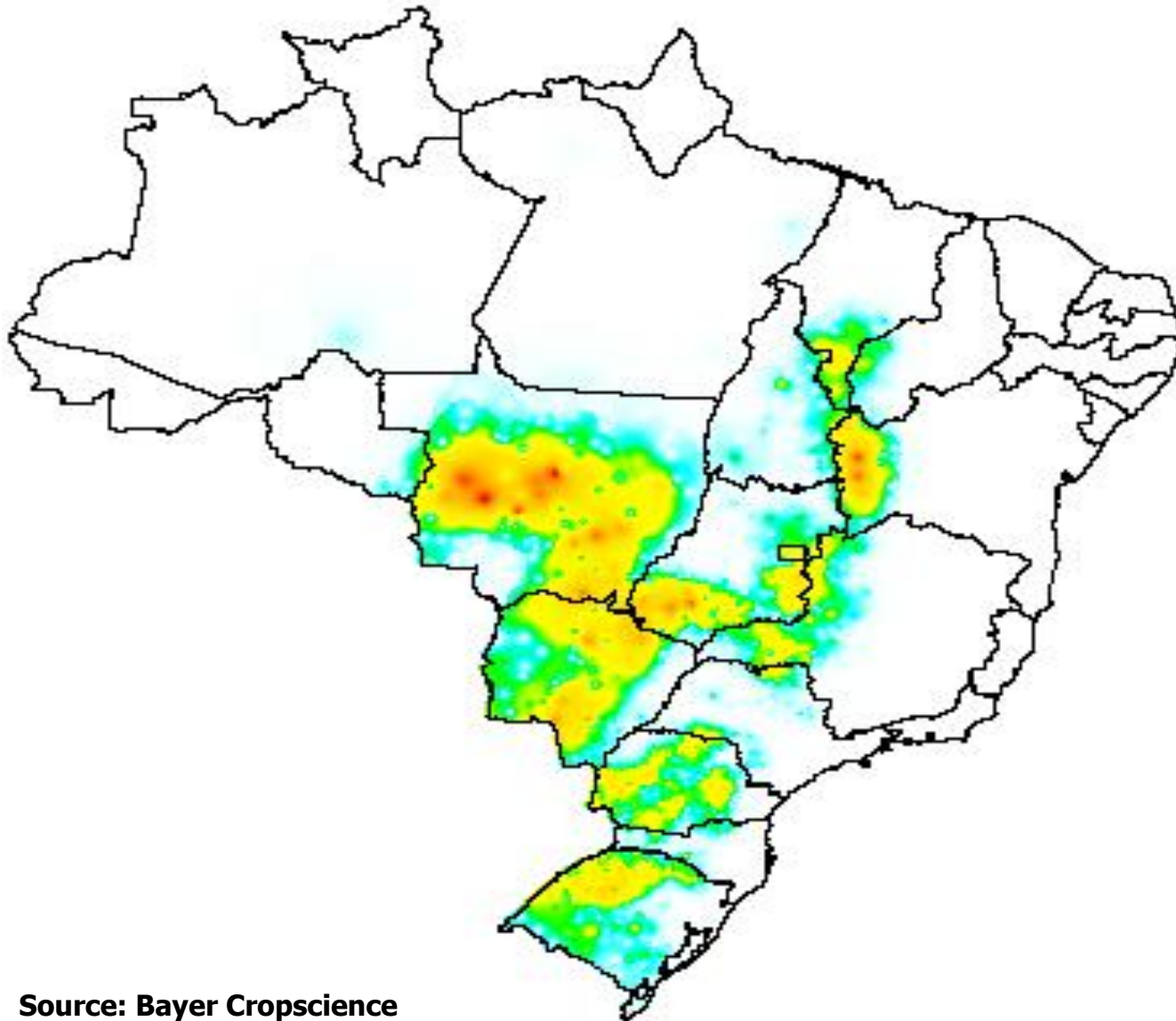


Grain Production Growth



- Increase of 220 million tons in 50 years
- Productivity: 3.1% annual increment
- Area Expansion: 53 million hectares

Soybean in Brazil



Source: Bayer Cropscience

Cultivated Pastures in the Brazilian Cerrado

60 Millions Hectars

1° 13' S

Percentage of
land under
pasture

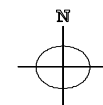


Source : Embrapa Cerrados base on
IBGE Survey 1995-1996

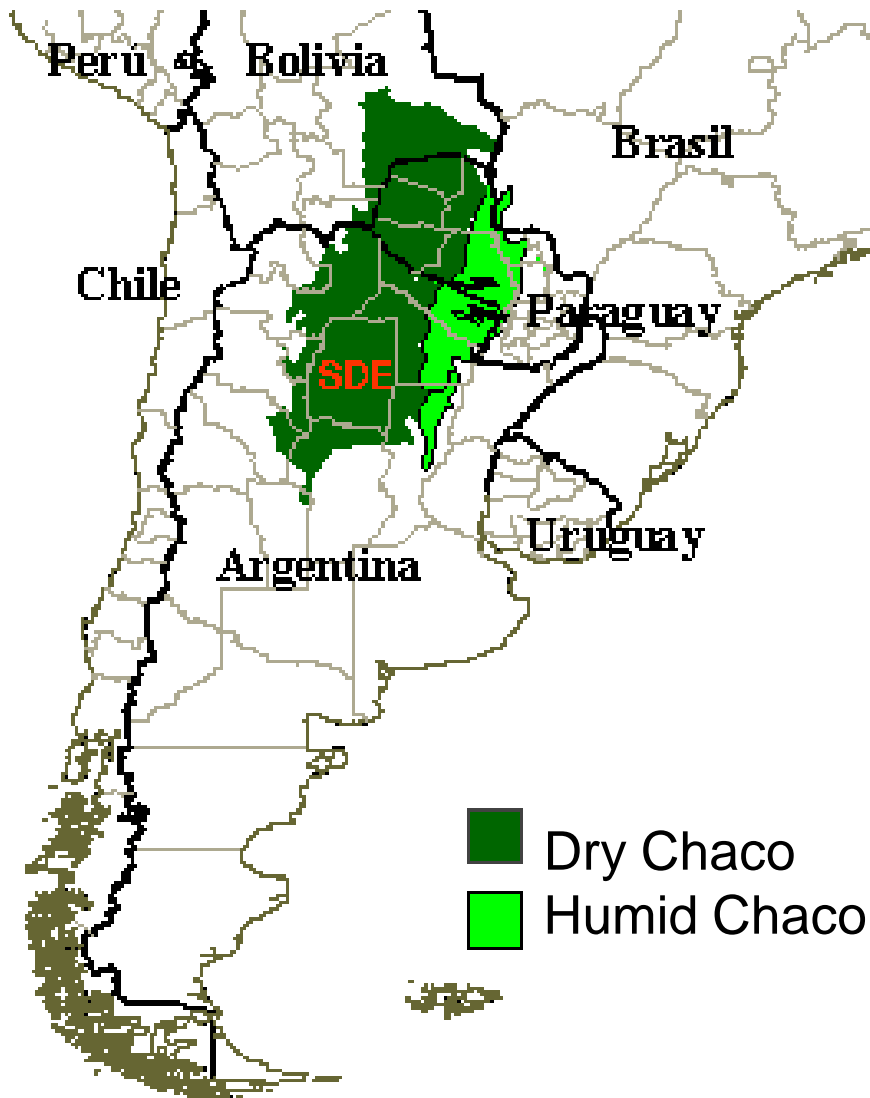
24° 08' S

68° 45' W

38° 15' W



Gran Chaco



Grassland Ecosystem Pampas

PACIFIC OCEAN

ATLANTIC OCEAN



Main Ecosystems



- Cerrado
- Great Chaco
- Pampas

Area under No-tillage by Continent

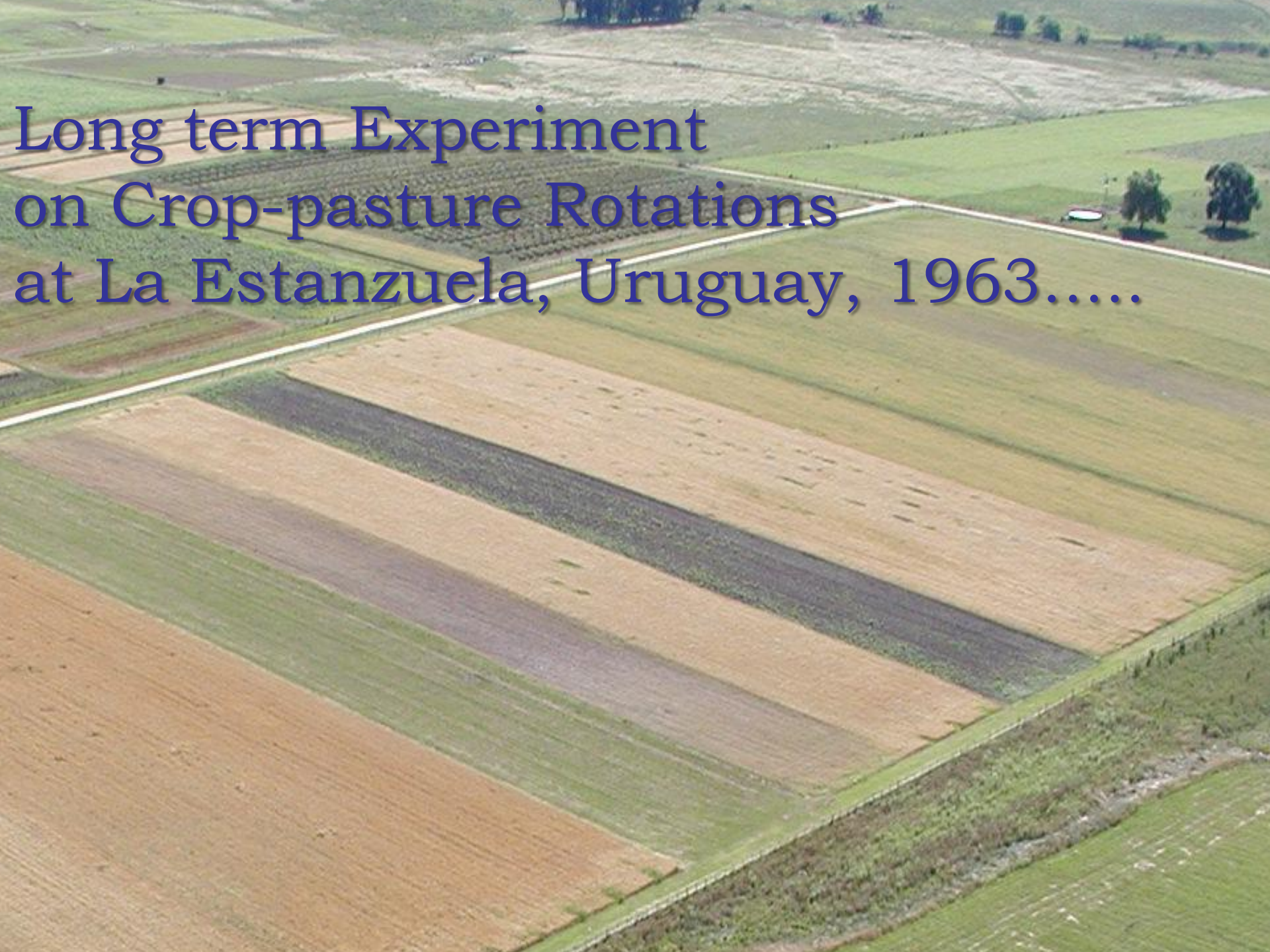
Continent	Area (hectares)	Percent of total/%
South America	49,579,000	46.8
North America	40,074,000	37.8
Australia & New Zealand	17,162,000	11.5
Asia	2,530,000	2.3
Europe	1,150,000	1.1
Africa	368,000	0.3
World total	115,863,000	100

Challenges and opportunities for development of integrated crop-livestock systems

60M ha of “Degraded Pastures”



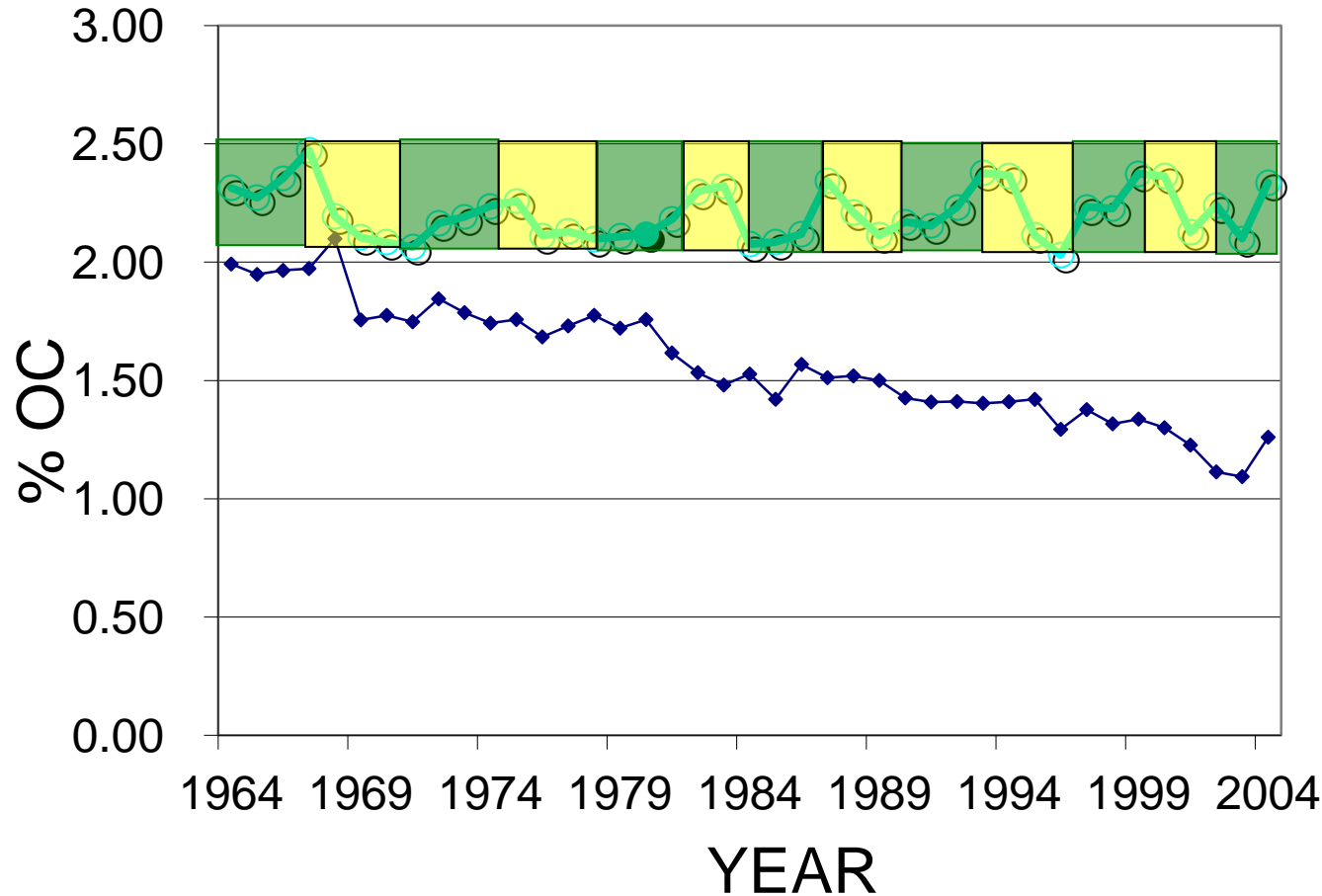
Long term Experiment
on Crop-pasture Rotations
at La Estanzuela, Uruguay, 1963.....



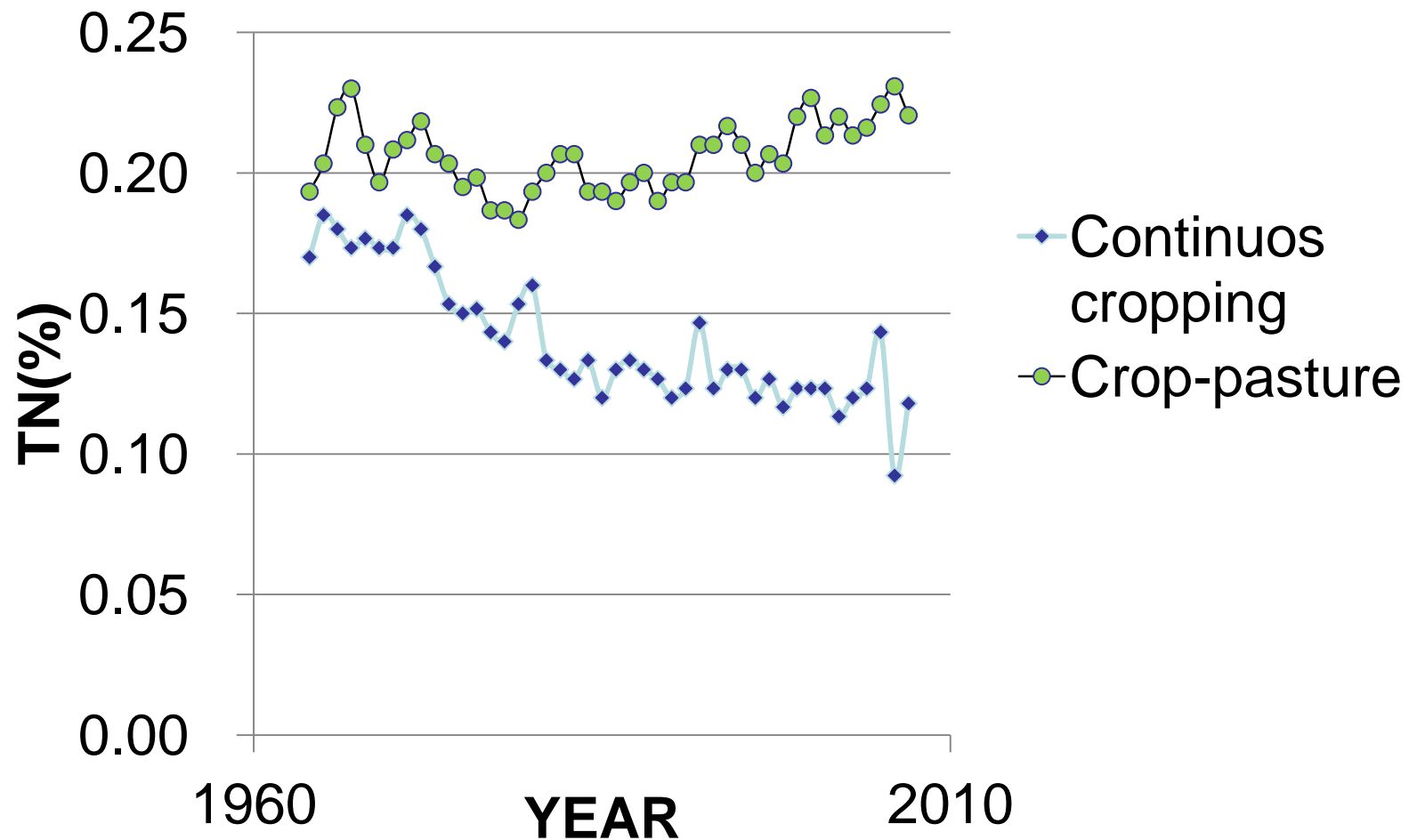
How does it work?

Wheat + Pasture	Pasture 2	Pasture 3	Pasture 4	CORN	SOYBEAN
			CORN	Barley	
					Corn

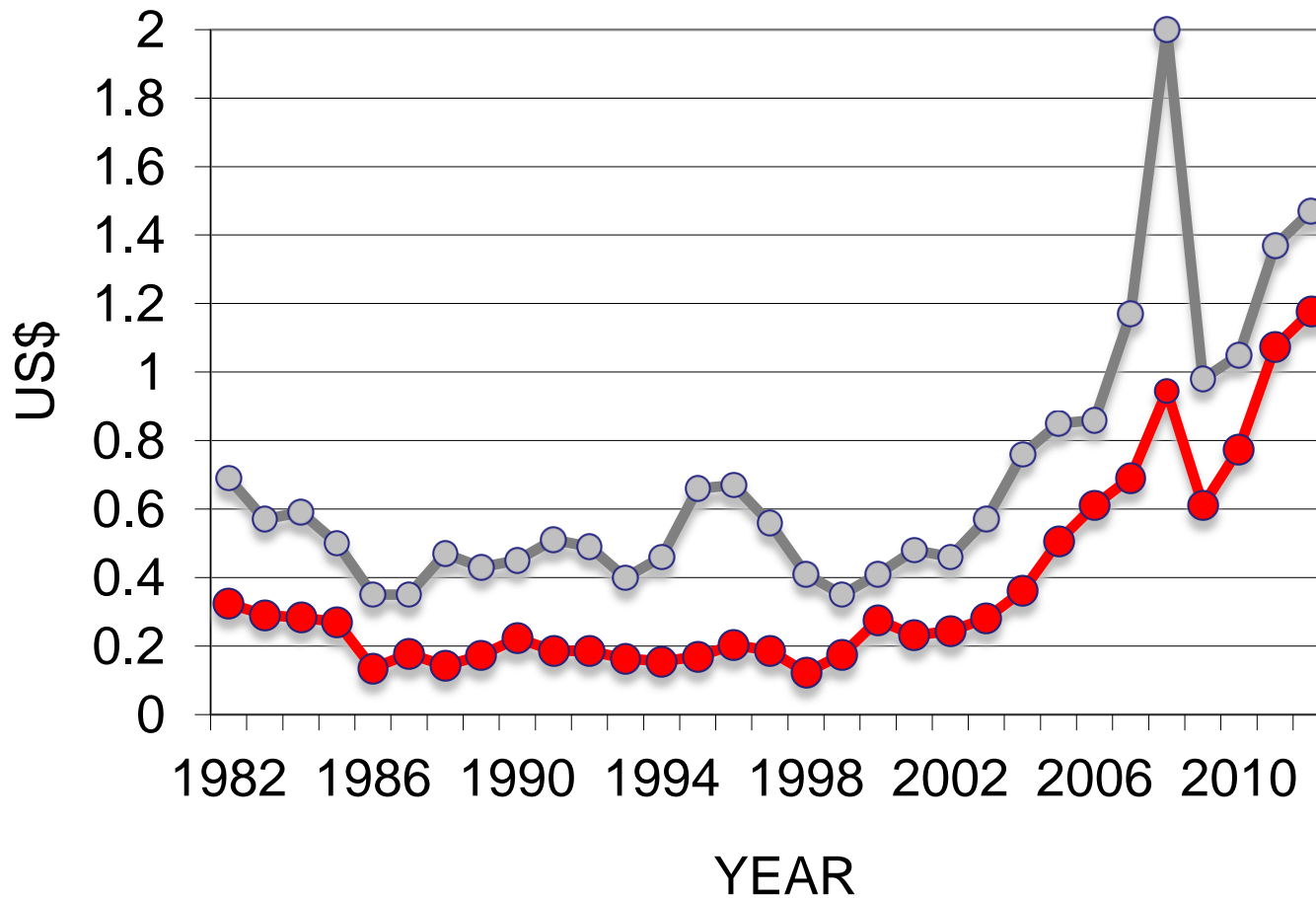
Organic Matter Dynamics in Crop-pasture Rotation and Continuous Cropping



Total Nitrogen Dynamics in Crop-pasture Rotation and Continuous Cropping



Price Relationship between Urea and Petrol



—●— UREA
—●— PETROL





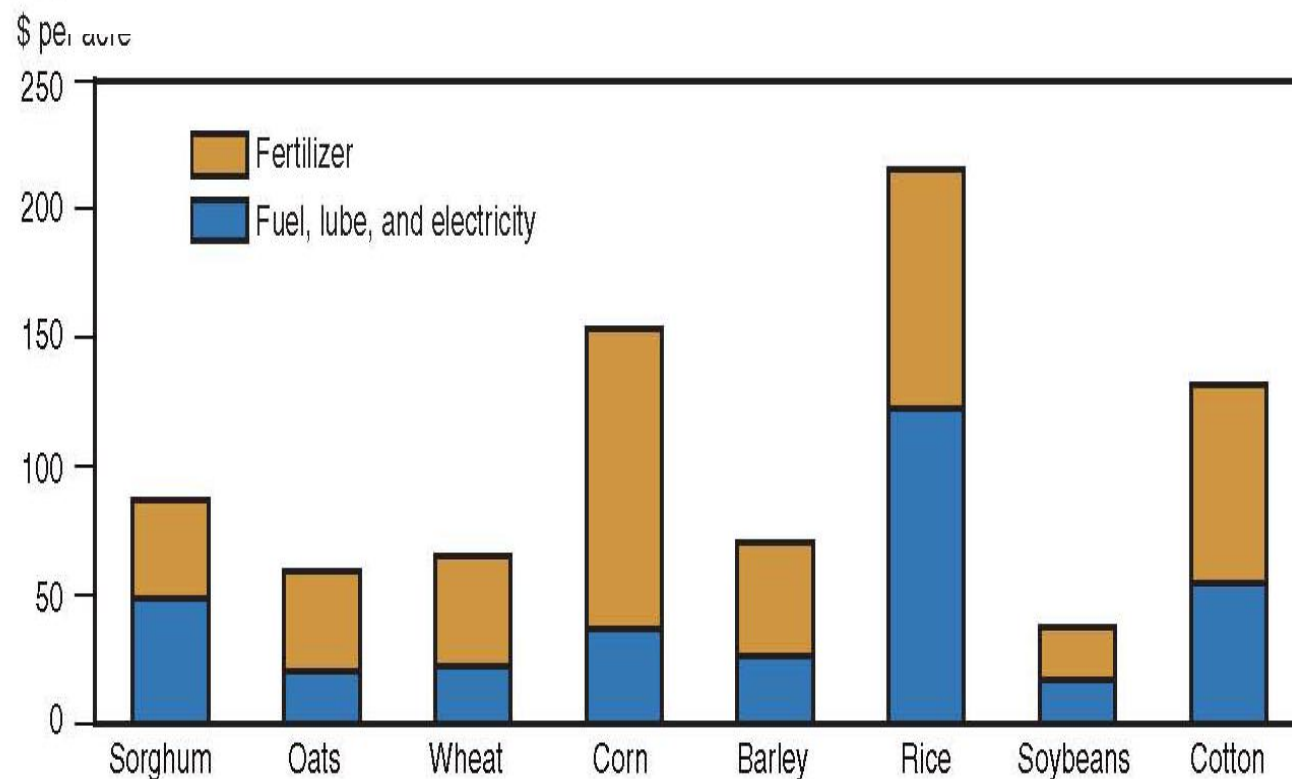
Impacts of Higher Energy Prices on Agriculture and Rural Economies

Ronald Sands and Paul Westcott (coordinators)



Figure 2.2

Energy-related expenses, selected crops, 2007-08 average

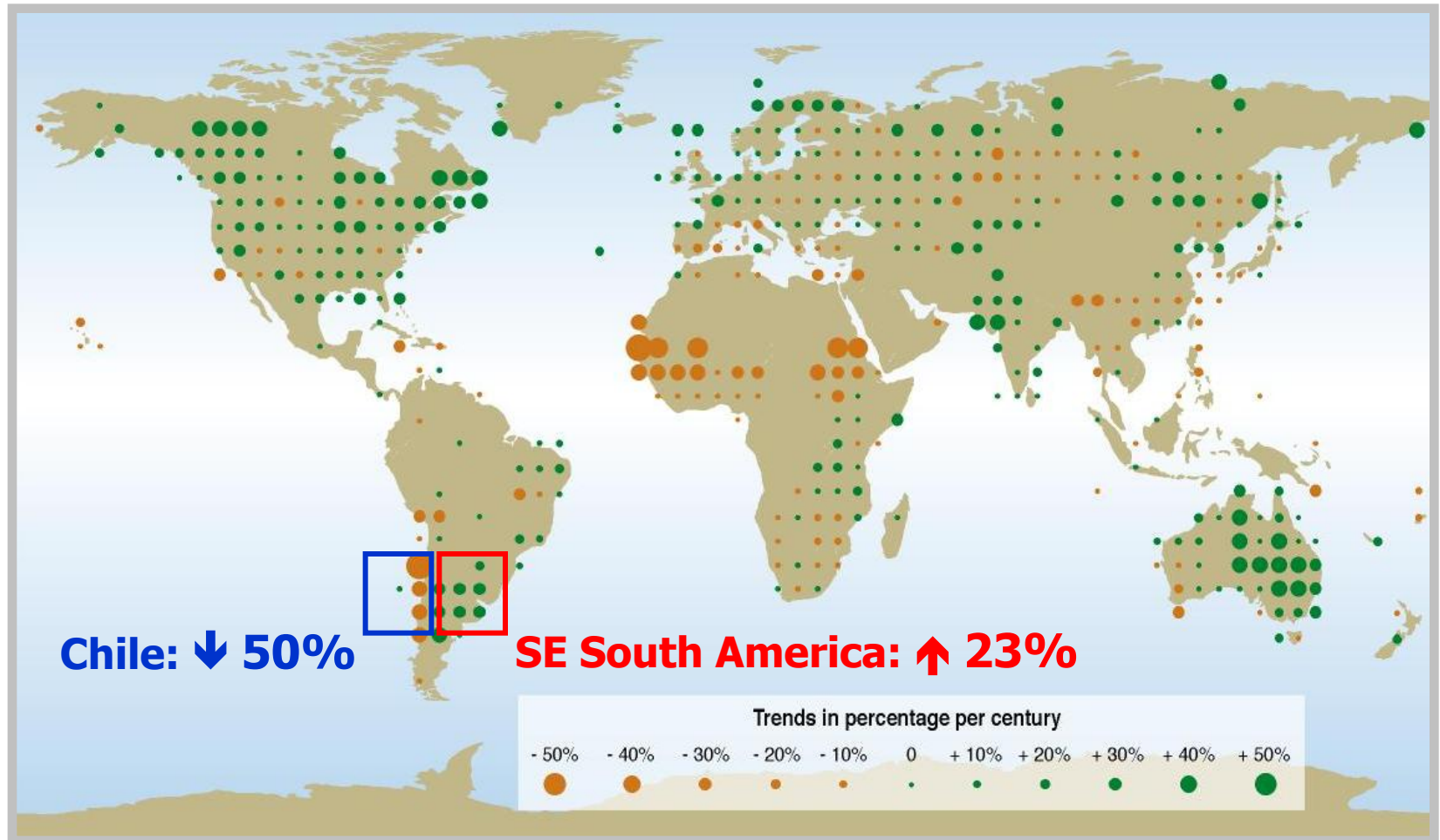


Source: USDA, Economic Research Service, Cost of Production Estimates.



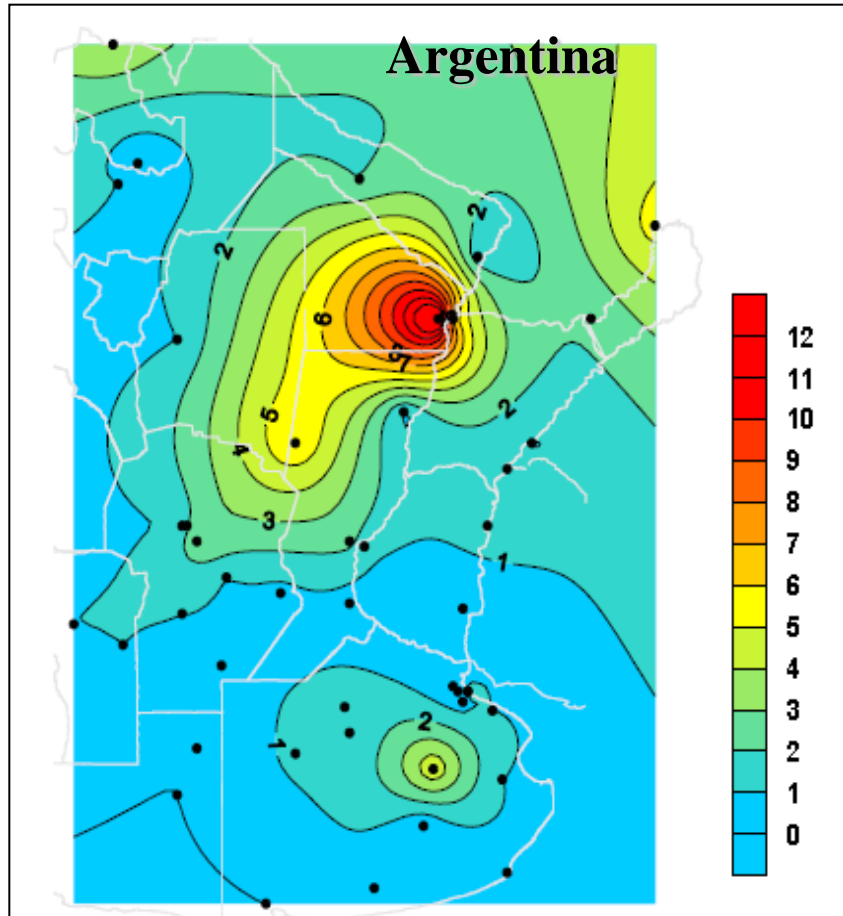
Climate Change

Global annual rainfall trends: 1900-2000

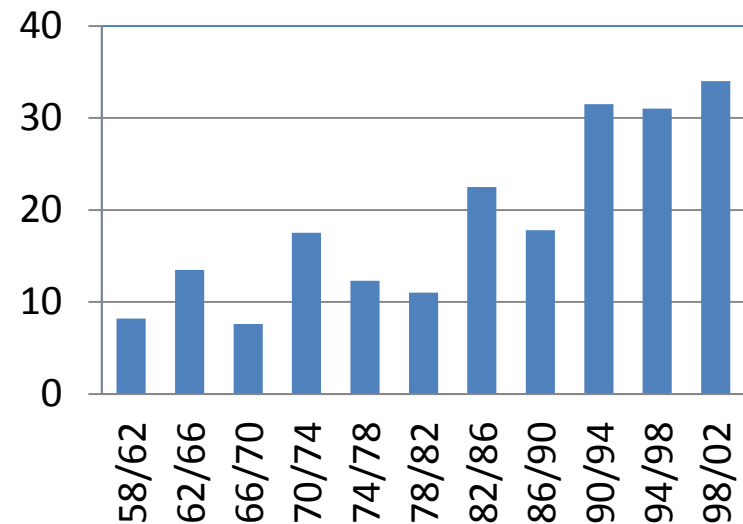


Increments in Variability

Argentina Case



**Rainstorms larger than
100 mm in 48 hs.**



The amount of rainstorms over 150mm-200mm during 1983-2002 was **three times greater than those** in 1959-1978, (Re et al, 2006).

Concluding Opportunities and Challenges

1. The productive expansion and intensification in LA impact in negative balance of SOC and TN in many agro-ecosystems in spite the increase in no-till.

Opportunities

1. The contribution of organic matter by legume pasture mixtures in rotation with crops was able to maintain or recover SOC in the long term even under conventional tillage.
2. Biological nitrogen fixation by legumes or any other BNF source takes a high economic relevance in livestock production with increasing prices of N.
3. Diversification through integrated crop livestock systems reduce productive risks by climate variability.

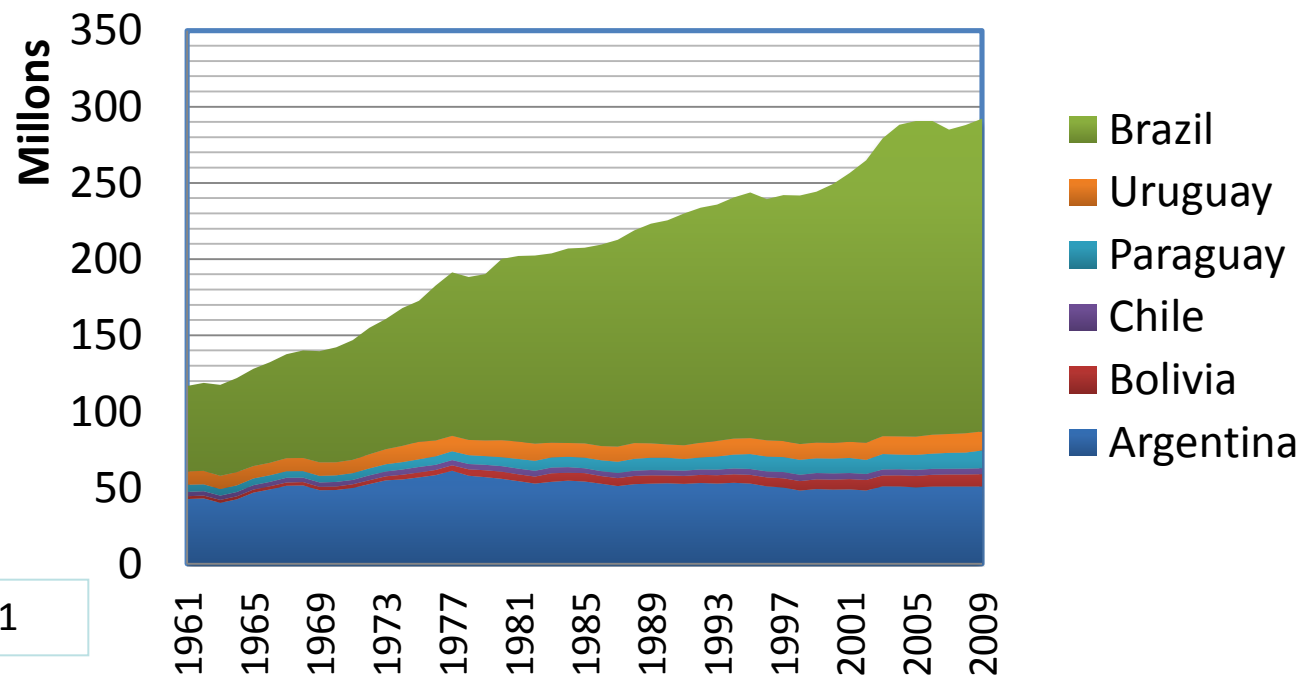
Challenges

1. Under cropping expansion by land availability integration with livestock is very much restricted
2. The integration of crop and livestock production progressively requires two different farmers developing the system. One farmer taking care of animal production and another dedicated to the crop farming. A key issue for this contractual relationship is the long term commitment of both, taking advantage of mutual benefits of the integrated system.
3. The integrated crop livestock systems, proved to have great environmental and productive benefits, but its adoption requires public policies to overcome its complexity, when economic advantages are not significant.

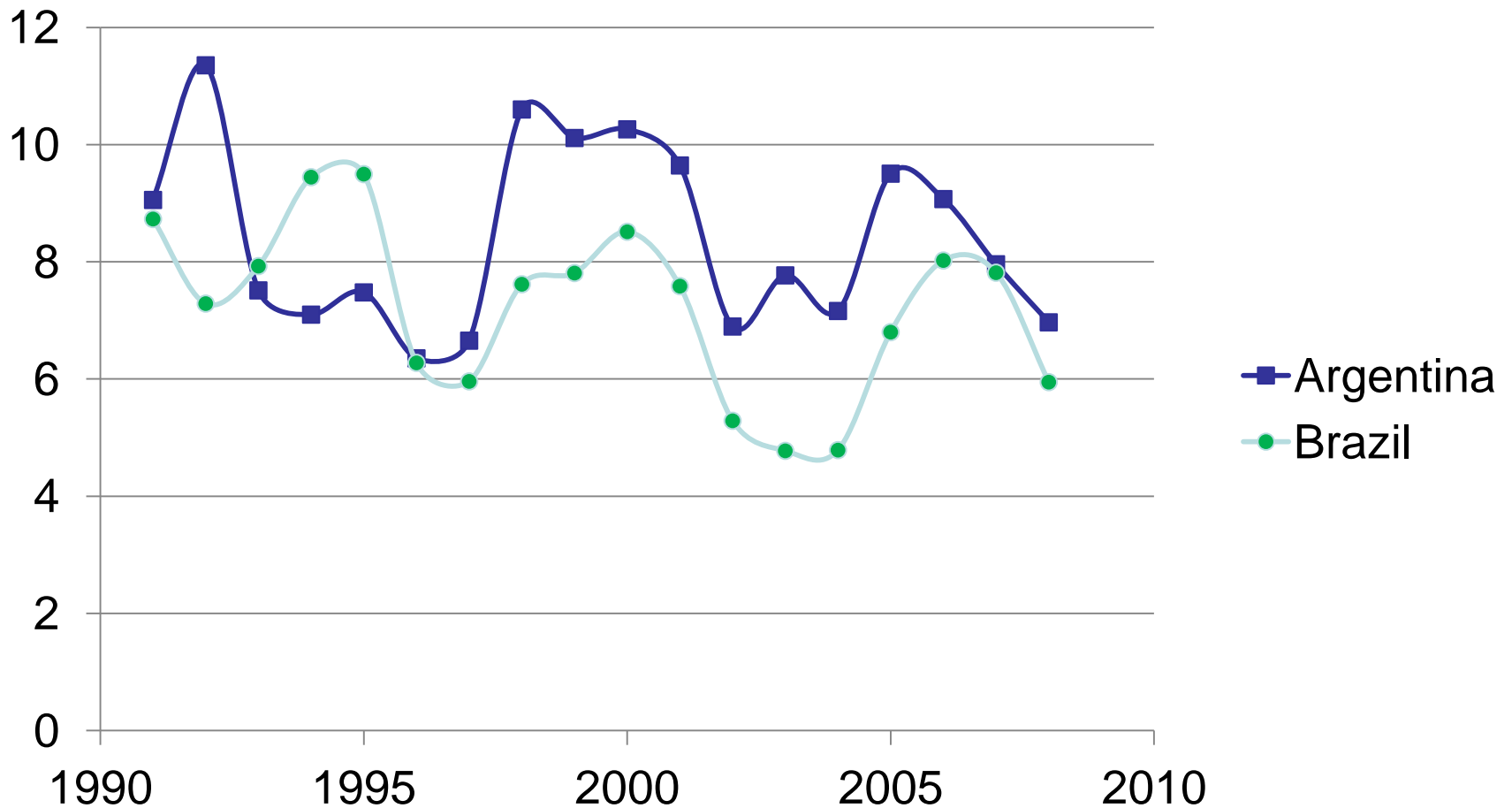
Thanks !



Increase in cattle stock in the Southern Cone of LA in the last 50 years .



Price relationship between Meat and Soybean



FAOSTAT., Farm gate prices per Ton.

Relación Carbono/Nitrógeno

