

Three Case Studies of GM crops in Developing Countries



ARGENTINA:

‘World’s breadbasket’ empty?

- **1st developing country to grow GM crops commercially, since 1996**
- **World’s second largest producer of GM crops**
- **Almost all soya in Argentina is herbicide-tolerant Roundup Ready (RR) soya (approx. 13 million hectares in 2003), mostly exported as oil and animal feed**

Changing face of agriculture

- **Intensification of export-oriented, industrial agriculture**
- **Loss of productive land to soya production**
- **Food security threatened by shift from traditional, sustainable mixed and rotation farming to large-scale soya monocultures**
- **Food crops and associated rural economies wiped out by RR soya (see Table 1)**
- **Argentina now imports what it used to consume locally and export**

Table 1: Area used for cultivating main crops - 1996/1997 and 2001/2002

	Rice	Maize	Sun-flower	Wheat	Soya
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
Difference	-44.1%	-26.2%	-34.2%	-3.5%	+74.5%

Source: According to Dominguez and Sabbatino 2003, with data from Secretaria de Agricultura, Ganaderia, Pesca y Alimentos (Area in million hectares)

Small farmers losing land

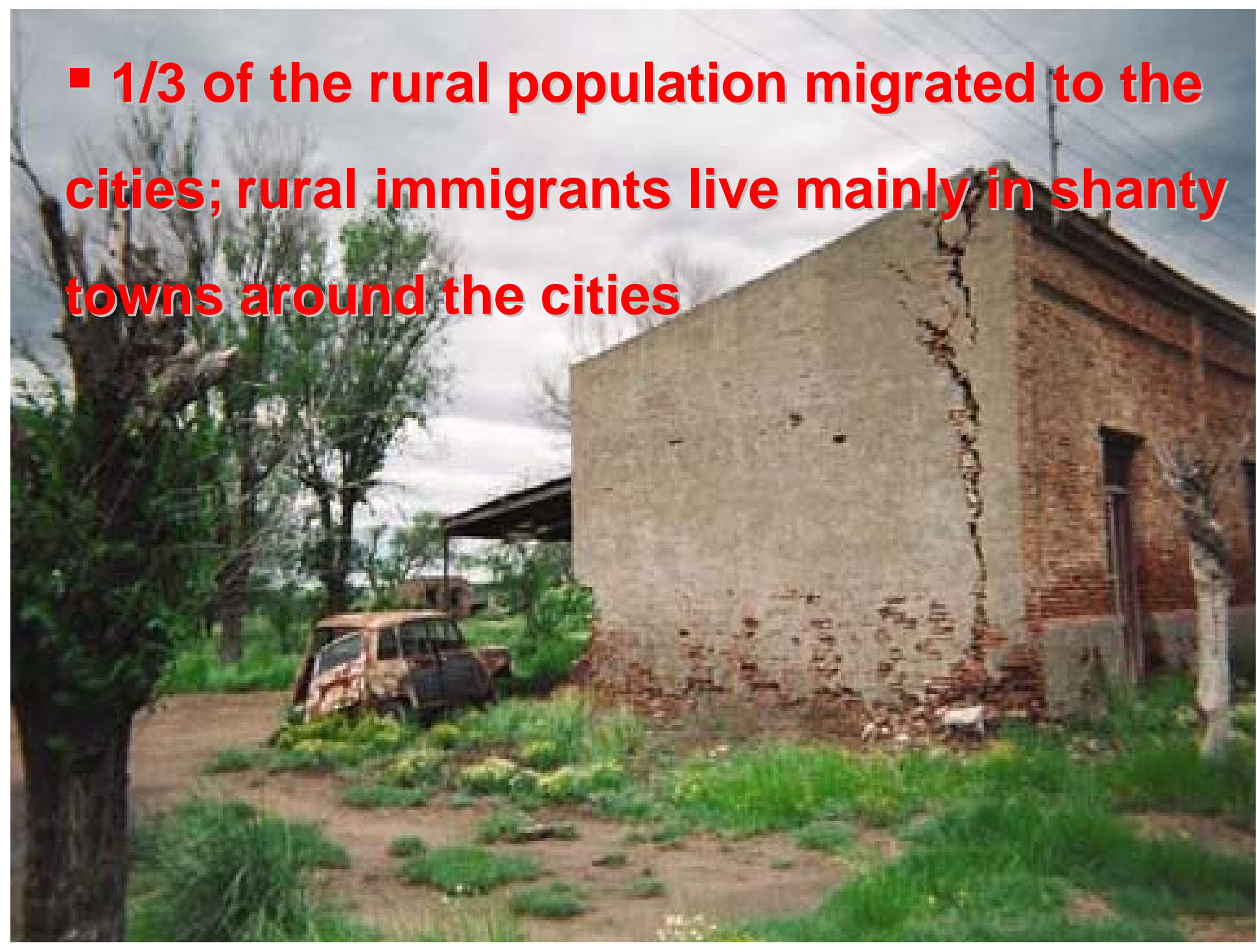
- **Small farming families have been forced off the land, unable to compete with large farms**
- **Twenty-four million acres of land belonging to bankrupted small farmers about to be auctioned off by the banks**
- **Peasants in Santiago del Estero, N. Argentina, have been threatened by big landowners linked to seed companies and supported by local police and paramilitary-like forces, who used force to take their land for planting RR soya**

During the 90's

- more than 500 villages were abandoned



▪ 1/3 of the rural population migrated to the cities; rural immigrants live mainly in shanty towns around the cities



Contested land ownership claims often end in eviction orders to remove peasants from the land where they have been living for generations



No increased yields

- **RR soya does not have increased yields - studies in the US have documented an average 5-10% decrease ('yield drag') in RR soya yields**
- **The increase in Argentinean soya production is due to an increase in acreage, not yields - this has led to a replacement of other crops with soya or has used more forest areas, contributing to deforestation**



República Argentina
Ministerio de Salud

Secretaría de Ambiente
y Desarrollo Sustentable



Dirección de Bosques



Figura 4.

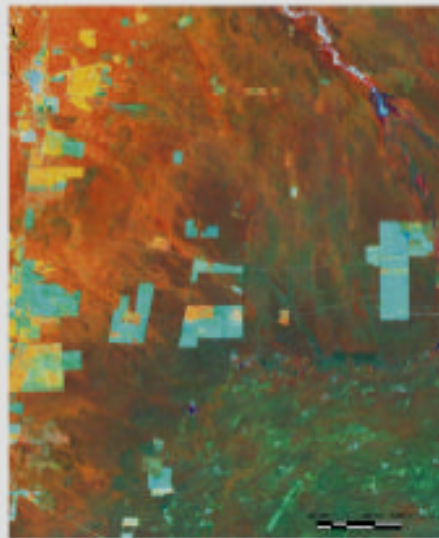
Secuencia de imágenes satelitales del área correspondiente al departamento de San Martín (Tartagal)

1984

1989

1997

2001



Deforestation rate in the transition area between Yungas and Chaco Forests increased from -0.6 in 1984-1991 to -1.17 in 1997-2001. This was mainly due to RR soya expansion to agricultural marginal areas, according to this November 2003 report.

More herbicides

- Glyphosate use was 28 m litres in 1997-98, 56 m litres in 1998-99, and over 120 m litres today.
- In Argentina, herbicide use on RR soya is more than double use on conventional varieties.
- Weeds have multiplied, as tolerance and resistance to glyphosate have increased, resulting in more frequent herbicide applications using higher spray concentrations.
- To control difficult weeds, including RR soya volunteers, toxic older herbicides, such as 2,4 D and Paraquat, banned in many countries, are used.

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- ▶▶▶▶ *Control residual de 60 días durante el barbecho.*

Glifosato + **Lontrel™**

- ▶▶▶▶ *Soluciona el problema de las malezas compuestas tolerantes a glifosato, sin importar su tamaño.*
- ▶▶▶▶ *Excelente control de: Cardos, Rama negra y Senecios.*

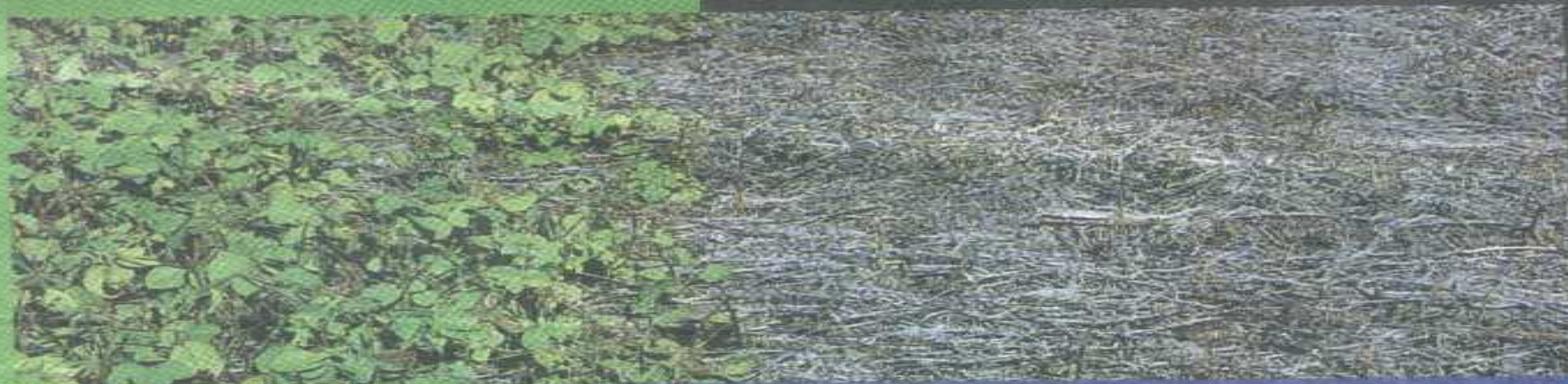
 **Dow AgroSciences**

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“Soya is a weed”

- **Syngenta now says, “soya is a weed”, referring to the RR soya volunteers left behind from previous harvests, which grow during the non-planting season**
- **In order to solve this “weed” problem, they promote the use of the highly toxic Paraquat (trade name Gramoxone), marketed by Syngenta, together with Gesaprim (active ingredient atrazine)**

LA SOJA ES UNA MALEZA.



Porque la soja guacha, como las malezas tolerantes a glifosato toma la humedad y nutrientes de su suelo perjudicando su próximo cultivo.

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Para mayor información comuníquese al Centro de AgroSoluciones Syngenta:
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Health impacts of increased herbicide use

- In February 2003, peasants in Colonia Loma Senes, Formosa lost 100% of their crops. They and their livestock suffered severe health problems**
- University of Formosa Province confirmed serious health problems in these communities due to pesticide fumigation on RR soya fields**
- In response, a judge banned fumigation of RR soya for 9 months, but this has been flouted**

- **Local farmer Sandoval Filemon from Colonia Loma Senes, North Argentina: “The poison got blown onto our plots and into our houses... Straight away our eyes started smarting. The children’s bare legs came out in rashes”.**
- **“Almost all of our crops were badly damaged. I couldn’t believe my eyes,” says Sandoval’s wife, Eugenia.**
- **Over the next few days and weeks chickens and pigs died, and sows and nanny goats gave birth to dead or deformed young. Months later, banana trees were deformed and stunted and were still not bearing edible fruit.**
- **The culprit? Neighbouring farms planting RR soya, forced to drench their land with a mixture of powerful herbicides to combat resistant weeds.**

(‘Argentina’s bitter harvest’, New Scientist, 17 April 2004)

About 300 families were affected by agrochemicals in Itapúa, Paraguay

Peasants blamed a Japanese and a German large soya producer for the incident.

Agronomist Walter Lezcano, from Centro de Capacitación y Tecnología Campesina(CECTEC), who accompanied the affected families, said that it was evident that the lesions observed in the children are characteristic for agrochemicals such as glyphosate and paraquat, used in conventional and RR soya plantations in this area.

Antonio Ocampos Benítez

11 years old

December 2003



'United Soya Republic'

Syngenta Advertisement



A map of South America with a large green area covering Bolivia, Paraguay, Argentina, and Brazil. The text 'República Unida de la Soja' is written across this area. A small logo of a soybean is in the top right of the map area.

República Unida de la Soja

La soja no conoce fronteras.

La información de Centinela, tampoco.

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The realities

- **A few years ago Argentina produced varied and healthy food for 8 times its population**
- **Now, in the ‘beef country,’ the poor are fed with crops used for animal feed in developed countries - food aid programmes (‘Soja Solidaridad’) are based on soya, which when eaten in excess, can have inhibitory effects on iron, calcium, zinc and B12 vitamin uptake**
- **Rural depopulation and collapse of rural economies, small farmers forced off land**

The realities

- **Deforestation and increased flooding**
- **Increased problems with herbicide resistant weeds, so more herbicides needed**
- **Health problems associated with pesticide fumigation on RR soya fields**
- **Possible fungal infections (*Phakopsora sp.* – soybean rust) associated with RR soya**
- **Increasing conflicts between large landowners planting RR soya and small farmers?**

INDONESIA: “*Bt cotton planting has given us more harm than good*”

- **Indonesia was the first Southeast Asian country to approve Bt cotton for commercial planting in 2001**
- **December 2003 - Indonesian Minister of Agriculture announced that Monsanto had pulled out of South Sulawesi**
- **After two years of planting, the government stopped the Bt cotton development programme and switched to a locally-developed non-GM cotton variety**

Farmers' experiences

- **Lower yields than promised**
- **Crop failure in drought**
- **Pest infestations on Bt cotton but not on other cotton varieties**
- **Farmers had to use more pesticides**
- **In 2002, farmers planting Bt cotton had lower income compared to farmers planting non-GM cotton**

‘Kapas palsu’ – broken promises of Bt cotton



Farmers caught in debt cycle

- **Due to poor yields, 70% of farmers could not pay back their debt to the company that supplied the seeds on credit schemes (they were supposed to sell the cotton crop back to the company)**
- **The company unilaterally doubled the price of the seeds in the second planting season and bought the cotton back at a lower price**

Some farmers burnt their cotton crop to protest the unfair deal



Who benefits?

- **Farmers bore the consequences of the poor harvests and unfulfilled promises of Bt cotton**
- *“The company didn’t give the farmer any choice, they never intended to improve our well being, they just put us in a debt circle, took away our independence and made us their slave forever. They try to monopolize everything, the seeds, the fertilizer, the marketing channel and even our life”*
- **The company abandoned the region, without being held liable for the problems it caused**

INDIA: “*Bt cotton unfit for cultivation and should be banned*”

- **Three varieties of Bt cotton were commercially planted for the first time in 2002 in central and southern India**
- **Reports from state governments, academic researchers, NGOs and farmers’ organisations indicate that, in many areas, Bt cotton performed poorly, and at times failed completely**

Farmers' experiences

- **Failure to germinate**
- **Damage in drought conditions**
- **Susceptibility to root-rot**
- **Susceptibility to leaf curl virus**
- **Increase in non-target pests**
- **Attack by bollworms**

Economic impacts

- **Study in Warangal district, Andhra Pradesh interviewed and surveyed Bt cotton farmers**
- **Non-Bt plants productive for 2 mths longer than Bt cotton – there was nett 35% decrease in yield per acre**
- **Marginal difference in pesticide use - some reduction in the incidence of bollworm, but increase in sucking pests on Bt cotton**
- **Bt seeds more expensive**

Economic impacts

- **Bt cotton fetched lower price in the market, due to smaller boll size and staple length**
- **Overall, non-Bt farmers obtained Rs 6,663 (approx. £80) more per acre than Bt farmers**
- **71% of Bt farmers experienced losses compared with only 18% of non-Bt farmers**
- **50.7% of Bt farmers surveyed said that they would not plant Bt cotton again**
- **AP government confirmed poor performance of Bt cotton and pledged compensation**