



Argentina: A Case Study on the Impact of Genetically Engineered Soya

Executive Summary

by Helena Paul, *EcoNexus*

of a report by Lilian Joensen (PhD) and Stella Semino (MA)

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I. Introduction

This case study explains why Argentina began to grow genetically engineered RR¹ soya and why its cultivation has spread so rapidly to more than 14 million hectares (ha) in 2003-4. It looks at the role that Argentina adopted in the 19th Century as an exporter of raw materials and a target for foreign investment. Other factors touched on include the massive accumulation of debt, economic collapse, financial speculation, capital flight and structural adjustment imposed by the Menem government (1989-99) according to instructions from international financial institutions like the World Bank and the International Monetary Fund.

The consequences of growing RR soya in Argentina include a massive exodus from the countryside as small farmers found they could no longer make a living or were driven off their land. The use of agrochemicals and chemical fertilisers has increased and the aerial spraying of herbicides has led to ecological contamination and health problems. Deforestation is accelerating. New diseases and tolerant weeds have emerged in response to the establishment of GE soya monocultures. Hunger and malnutrition have appeared in a country long accustomed to producing 10 times as much food as the population required. Now RR soya is being imposed on poor Argentineans as a substitute for meat, milk, eggs, lentils and other traditional products, thus forcing a change in the national diet. Such food projects are often presented as charity and backed by those profiting from soya production. However, the government sees the export of RR soya as a key factor in servicing the country's massive debt. Argentina is a warning that GE crops are no solution for hunger, debt or agricultural problems. In fact they are a threat to food sovereignty and security and a tool for inducing dependence.

¹ RoundUp Ready soya, Monsanto's soya genetically engineered to be resistant to the herbicide glyphosate and described therefore as RR soya, RoundUp being the brand name of Monsanto's glyphosate product.

II. The Economic and Political Context

During the 19th century, as a result of colonisation, Argentina became an exporter of raw materials (mainly agricultural products) and an importer of manufactured products. Once the national state of Argentina was established in 1853, the process of internal colonisation accelerated. This included the "conquest of the desert", which involved removing indigenous peoples by force from land required for agriculture, accelerated. The government also adopted an economic model that facilitated exports and began to contract debt. However, although Argentina was exporting agricultural produce, much of it to the UK, there were many differences between the impacts then and now. At that time it was mainly producing food for internal consumption, there were no toxic chemicals being applied, people were able to save their seed and make their own farming decisions, and there was plenty of rural employment.

In 1890, the country suffered an economic collapse and the peso was devalued against the price of gold, helping the export sector. The introduction of foreign currency payments ensured a rapid recovery. After 1890, UK interests in the country shifted and investment focused on the railways. Between 1880 and 1913 investment in railways increased 30-fold and itinerant workers produced millions of railway sleepers from the forests of North East Argentina. Railways were not routed to facilitate the movement of people but of commodities to the ports (Buenos Aires and Rosario) Today's parallel is the construction of the *Hidrovia* (Waterway) the massive intergovernmental project to build canals and link rivers so as to open up the whole continent to big cargo vessels for exporting goods. It is calculated that 48% of goods carried will be crops and fertilisers. US companies plan to transport 70,000 tonnes of oilseeds (including soya) per day for processing at the industrial centre ROSAFE close to the port of Rosario.

One of the architects of Argentina's agricultural modernisation, José Martínez de Hoz, wrote a book in 1967 renewing the call for Argentina to base its economy on industrial export agriculture. The green revolution began with importing hybrid

seeds, chemical fertilisers and machinery. Most of the food produced was consumed internally as international prices at that time did not favour exports. The country's debt increased markedly between 1976 and 1983 under the military dictatorship. In spite of this, Argentina was able to attract loans from the World Bank, the IMF and the Club of Paris. The promise of quick returns attracted large-scale investment and financial speculation, which became important components of the country's economy. During this period, power was concentrated increasingly in the hands of a small elite.

The period of democratic consolidation in Argentina, between 1983 and 1989, was marked by hyperinflation fuelled by speculation on the peso against the dollar. Low international prices for exports did not help either. In 1984 the new democratic government sought to promote a greater use of fertilisers with a plan to exchange agrochemicals for grain produced. In 1989 the fiscal system collapsed, together with incomes, while national industry continued to decline. This meant that President Menem's proposal to turn Argentina into a first world country and reduce its debt through a neo-liberal programme was welcomed as a possible way out. Menem followed the World Bank, IMF, and the Inter-American Development Bank's standard prescription for economic recovery: monetary reform, fiscal reform, and reducing taxes and restrictions on imports and exports. It also meant cutting state expenditure by privatising the public sector, the social support system and pensions. Even state funding for scientific research was scaled back with the aim of making public services "more efficient". However, instead of being alleviated, the debt tripled, reaching US\$198 billion by 2003. The impending economic crisis was exacerbated by capital flight on a massive scale. At the same time, national industry was decimated, unable to compete with cheap imports, and Argentina once again began to export raw materials and import goods made from them. The economy finally collapsed in 2001, and this time the peso was devalued against the dollar, which in turn helped to promote the export of RR soya.

III. The Introduction of RR Soya

Between 1991 and 2003, the government gave 670 permits for the deliberate release of genetically engineered (GE) crops, including maize, sunflower, soya, cotton, wheat, potatoes and alfalfa. No information was given to the public or to Congress about what was happening. The Advisory Commission on Biotechnology included representatives from biotech companies such as Monsanto, Syngenta, Dow AgroSciences, and Bayer CropScience.

In 1996, a time when international prices for soya were high, the government gave a licence to

Monsanto to grow RR soya. At this point, Monsanto was not able to charge royalties because they had not been granted a patent on the gene for glyphosate resistance in Argentina, which meant that farmers were able to save their seed from season to season. Glyphosate was cheap, giving Argentina a further advantage in international sales. Since credit was hard to obtain, farmers were instead given packages of seeds and inputs by seed and chemical distributors, to be paid for after the harvest. These companies also rented land to grow soya and, over the next few years, RR soya seed was smuggled from Argentina to be grown illegally in Brazil, Paraguay, Uruguay and Bolivia. Monsanto then began to demand royalties in Brazil and Argentina. In Argentina, soybean seed continues to be saved and sold without royalties because the struggle over how royalties should be collected has not yet been resolved in spite of pressure from Monsanto. .

The production of soya in Argentina has increased dramatically in recent years. In the early 1970s, soya was being produced on just 9,500 hectares (ha) of land. By 1996, this figure had increased to 5.9 million ha, and soon rose inexorably to 10.3 million ha in 2000 to 2001, and further still to 14.1 million ha during the 2003 to 2004 season. Most of this total is now GE. Though the area under cultivation rose by 1.5 million ha between 2002 and 2003 at the expense of other crops and forest clearance, total production did not increase but fell slightly, from 34.8 million tonnes to 34.77 million tonnes because overall productivity, actually fell by about 10.5%. The government is unwilling to acknowledge this problem because it sees the income from RR soya as the main way to service the country's debt.

IV. The Rural Exodus and the Growth of Poverty

In 1992, the Argentine government proclaimed that 200,000 producers would have to quit farming because units smaller than 200 hectares were deemed to run at a loss. Small farmers have found it extremely difficult to compete under the economic conditions in the country and the arrival of RR soya has increased the pressure. Small farmers cannot afford the massive machines used for direct drilling and direct drilling and large scale spraying require little manual labour, so many people have sold or rented their land and left, together with workless farm labourers for slums in the cities. Others have been driven out due to threats and violence. "Sowing pools", powerful investor groups that have replaced contractors and brought in their own employees to grow soya, are farming large areas of land.

The export model exemplified by soya seriously threatens food sovereignty in Argentina. The Argentine diet used to include plenty of cheap meat, dairy produce, lentils, beans and other vegetables. Mixed farming, with animals and crops in rotation, provided good yields but received no support from the government. In recent years, soya

has replaced the production of food staples, which are now being imported. This has led to higher food prices for the population. In fifteen years Argentine dairy farms decreased by 50%, from 30,000 in 1988 to 15,000 in 2003. Milk is now being imported from Uruguay at a higher price.

The population of Argentina is predominantly urban, so the rural crisis has long remained invisible. Nobody believed there could be hunger in a country that produced so much food. However, economic instability, public sector reform, wage cuts, the dismantling of national industries, replacing national food crops with RR soya for export and the rural exodus have all had disastrous consequences for ordinary Argentines. In 1970, 5% of the population were below the poverty line, in 1980 12%, in 1998, 30% and in 2002 51%. Malnutrition among infants is estimated to be somewhere between 11% and 17%, and rising.

In some regions, RR soya is exacerbating old injustices. In the nineteenth century the region of Santiago del Estero supplied the rest of the country with agricultural products. The beginning of the twentieth century saw the massive extraction of timber to make more than 20 million sleepers for the new railway system. Much of the mobile labour force that carried out this work settled on the land afterwards. Argentine law says that if people settle on a piece of land for 20 years it becomes theirs, but the legal process of proof is complex. This has been the case in the province of Santiago del Estero, an area that has long been subject to almost feudal rule, with rampant deforestation and the concentration of land in the hands of the few. In this part of the country and coinciding with the emergence of the soya boom, strangers began to approach long-established peasant communities, claiming to own their land. If they refused to leave, armed groups would steal their cattle, burn their crops and threaten them with violence. Once traditional communities like these are dislodged, the situation becomes irreversible. To counteract this phenomenon, a peasant organisation called the Santiago del Estero Farmers' Movement (MOCASE – *Movimiento Campesino de Santiago del Estero*) has been formed to defend the rights of local people. So far, they have had some successes. Nevertheless, the lure of profits from RR soya is the latest and most serious threat to their livelihoods.

V. New Pest and Weed Problems

Direct drilling, and its no-till, lo-till or conservation tillage variations, was introduced in the US to save time and money for farmers, and also to counter erosion. The land is not ploughed, but instead the farmer incorporates the old crop residue into the top few centimetres of soil, drills in the seed and presses down the soil. With specialised machinery, one man can do everything in a single operation.

Evidence shows that pests flourish and diseases lurk in the rotting crop residues, which

means that slug pellets and additional pesticides may be required. Although perhaps not originally developed to promote chemicals, direct drilling has now become widely associated with the use of glyphosate and RR crops. Since the introduction of direct drilling, new disease problems have arisen. For example, the fungus *Phakopsora pachyrhizi* (Asian rust) has recently appeared in Argentina, Brazil and Paraguay. The spores survive in the crop residues and are dispersed by the wind. Weed communities are also changing, with a number showing increasing tolerance to glyphosate. This means that producers are now using 2,4.D, metsulfuron methyl, imazetapir and atrazine in addition to glyphosate. They also use paraquat and atrazine to deal with "soya volunteers" – fallen seeds which grow after the harvest. In the future they may also have to use fungicides on a massive scale.

Syngenta, which produces paraquat, atrazine, and fungicides, proclaimed in December 2003 that Argentina, Brazil, Paraguay, Bolivia and Uruguay constitute the "United Soya Republic".

VI. RR Maize Approved for Argentina

As RR soya spread, producers were experiencing problems with conventional maize in neighbouring fields which were sometimes damaged by glyphosate spray drift. Promoters of GE crops said that RR maize would solve the problem and also reduce the amount of herbicide required. Before Monsanto's RoundUp Ready maize (NK603) was approved, the European Union (EU), which imports some 2 million tonnes of maize from Argentina per annum, appeared ready to reject GE maize. Monsanto therefore recommended that, if approved in Argentina, RR maize should be used inside Argentina. However, in July 2004, the EU finally approved NK603 maize for importing and processing, and just a few days later it was approved in Argentina. At that point Monsanto's shares increased to US\$36 per unit.

VII. The Impacts of Pesticide Use

Communities close to soya cultivation have been seriously affected by aerial spraying of herbicides, most commonly, glyphosate. One study in Loma Senés, province of Formosa, involved peasants with an average land-holding of 10 ha who used to grow cotton until the international price collapsed. Today, they grow mixed vegetables for their own consumption, selling any surplus. However, the community is surrounded by large areas of land which have been rented out for soya production using the direct drilling technique. In February 2003, the peasants found their crops destroyed by aerial spraying of glyphosate. Their chickens died, and other animals, especially horses, were adversely affected. People suffered from nausea, vomiting, diarrhoea, stomach pains, skin lesions, allergies and eye irritation. They succeeded in stopping the spraying for a few months, with the help of their local

organisation, MOCAFOR, or *Movimiento Campesino de Formosa*, but it has since been resumed. Similar cases have been reported from many parts of the country and there are also cases involving other chemicals such as 2,4.D.

VIII. Deforestation

Facilitated by good soya prices, high levels of investment, better roads and more powerful machinery, high levels of deforestation for soya cultivation have been reported from the Yungas and Chaco regions. This has led to an increase in cases of leishmaniasis (*Leishmania [Viannia] Braziliensis*) a parasitic infection transmitted by sandflies that deforestation has brought into closer proximity with human beings. Treatment is relatively expensive and re-infection is common, leading to terrible scars and deformities.

In Entre Rios, where an order forbidding deforestation was implemented in October 2003, almost 1.2 million ha of forest has been removed in the last few years, due in part to the expansion of soya from 600,000 ha in 1994 to 1,200,000 ha in 2003. Up to 30% of soya production there is now carried out by sowing pools. In all these regions, the loss of biodiversity is catastrophic. Modern soya varieties are extremely efficient at extracting nutrients from the soil, so the crop flourishes when first planted in areas where forest has recently been cleared, but soon exhausts the land.

IX. Soya as the Solution to Hunger: Changing the Argentinean Diet

Over the last few years, as resistance to RR soya has grown outside Argentina, propaganda to promote soya as the solution to problems within Argentina, especially hunger, has increased. At the end of 2001, the Argentine Association of Direct Drilling Producers (AAPRESID) launched the "Soya Solidarity" campaign, through which 1 kg of soya for every tonne exported was "donated" to feed hungry people. In fact, although at first it was given away free of charge, it was later sold. At the same time, big efforts were made to promote soya as a safe and nutritious substitute for meat, milk and eggs. Some even asserted that it was superior in quality and safety to all three. Because soya never formed part of the traditional Argentine diet, nobody knew how to use it. Therefore, recipes were soon concocted for making dishes using soya instead of meat, eggs or milk. However, even though soya was cheap, the public remained unconvinced and many public projects gave up using soya altogether. The government continued to provide the information that soya should not be given to children under 5 and only to those under 2 with a doctor's advice. Yet it did nothing to oppose the promotion of soya, even though the National Forum for a Feeding and Nutrition Plan (2002) made it clear that soya is not good for bone development and that it contains little iron, of a kind that is difficult for the body to utilise. They also

recommended that its protein should be complemented with that of other vegetables.

As soya was touted as the solution to hunger and malnutrition, the corporations and influential social actors joined ranks. The Church became involved in the charitable efforts of Soya Solidarity to feed the poor with soya and DuPont pledged assistance through its "Proteins for Life" programme. The "Food Bank Project", which began in 2000, collects unsold food stocks from companies for distribution (including Kraft Argentina, Nestlé Argentina, and Procter & Gamble). Along with DuPont and the National Scientific and Technical Investigation Council of Argentina, the Food Bank Project has been experimenting with ways of including other foods to supplement the nutritional values and taste of soya. DuPont recently provided food fortified with soya proteins to 3,500 poor people in Buenos Aires.

X. Conclusions

This case study shows that industrial soya production is not a sustainable option. Nor is the production of GE crops for export a solution to hunger. In fact, as RR soya production has risen, hunger has increased in Argentina to unprecedented levels. Moreover, the use of agrochemicals has not been reduced. Argentinean agriculture has not only become dependent on inputs, but is also using pesticides which are prohibited elsewhere. Furthermore, Argentina has committed itself to the production of commodities for export, at the expense of its own natural resources and future generations, in order to service its debts. This focus on exports is the standard prescription of the international financial institutions, such as the World Bank, that promote the opening up of countries to free trade. The effect is to deprive countries of control over their own development, repeating the pattern of the colonial period. GE crops have played a key role in facilitating this process in Argentina. The Argentine case should sound the alarm for any country seeking to defend its food security and sovereignty.

An EcoNexus and Gaia Foundation Briefing

This executive summary can be downloaded from www.econexus.info and www.gaiafoundation.org

The report can be found in Spanish on www.gaiafoundation.org

For further information contact H.Paul@econexus.info or

EcoNexus, PO Box 3279, Brighton BN1 1TL, UK

The Gaia Foundation, 6 Heathgate Place, Agincourt Road, London NW3 2NU, UK