

An hourglass-shaped graphic with a globe inside. The top bulb is dark blue, and the bottom bulb is light blue. The globe is centered in the narrow neck of the hourglass. The text is centered within the hourglass.

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*Genetically Engineered Soybeans: Acceptance and Intellectual
Property Rights Issues in South America*

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Abstract. Commercial use of roundup ready soybeans in Brazil remains illegal despite apparent widespread planting. A 1998 government approval of their commercial use remains suspended by court injunction, and resolution over their commercial legality is being considered by an appellate court. The outcome on commercial legalization of genetically engineered crops in Brazil may have important consequences for intellectual property rights, as well as for international trade in genetically engineered crops.

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Genetically Engineered Soybeans: Acceptance and Intellectual Property Rights Issues in South America

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Summary

U.S. soybean growers and trade officials charge that Argentina and Brazil—the United States' two major export competitors in international soybean markets—gain an unfair trade advantage by routinely saving genetically-engineered (GE), Roundup Ready (RR) soybean seeds from the previous harvest (a practice prohibited in the United States) for planting in subsequent years. These groups also argue that South American farmers pay no royalty fees on the saved seed, unlike U.S. farmers who are subject to a technology fee when they purchase new seeds each year. The cost saving to South American soybean growers on the technology fee alone nets out to about \$8 to \$9 per metric ton—a considerable cost advantage over U.S. soybeans in the highly competitive international soybean market. This practice also raises concerns about the intellectual property rights (IPR) of Monsanto (the developer of RR technology).

Commercial use of RR soybeans in Brazil remains illegal despite apparent widespread planting. A 1998 government approval of their commercial use remains suspended by court injunction, and resolution over their commercial legality is being considered by an appellate court. However, two recent Presidential decrees have given temporary reprieve to the ban on planting and marketing GE soybeans through December 2004. The eventual outcome on commercial legalization of GE crops in Brazil may have important consequences for intellectual property rights, as well as for international trade in GE crops. This report will be updated as needed.

Introduction

The United States is the world's leading producer and exporter of soybeans. However, South American soybean production and trade has expanded rapidly during the past 15 years, greatly increasing the competitiveness of international oilseed markets. Together, the United States, Argentina, and Brazil are expected to produce nearly 83% of the world's soybeans in 2002/03, and to account for over 90% of all soybeans traded

on international markets.¹ Given a highly competitive international soybean market and growing international debate over the nature of production and trade in genetically-engineered (GE) crops, controversy has emerged in recent years over the growing pirated use of Roundup Ready (RR) soybeans, a GE variety, by producers in Argentina and Brazil.² This practice appears to provide a competitive advantage to Argentine and Brazilian soybean exports, and to be a violation of the intellectual property rights (IPR) of the RR technology producer, Monsanto.

Roundup Ready Soybeans

Roundup Ready (RR) soybeans are genetically engineered to be resistant to the herbicide glyphosate. Glyphosate also was developed by Monsanto and is marketed under the brand name Roundup. RR soybeans are patented in the United States by Monsanto.³ Monsanto licenses the RR technology to seed companies, which incorporate it into their conventional soybean varieties and sell the GE seeds to farmers. Among other things, the patent gives Monsanto and those companies to whom it has licensed the technology more control in setting prices and restricting the product's use. For example, U.S. farmers pay a technology fee estimated at \$7.44 on each 50-pound bag of RR planting seed.⁴ In addition, as part of a signed purchase agreement, U.S. farmers are prohibited from saving seed from harvest for future planting or for resale to other farmers. Despite the additional cost and restrictions, RR soybeans are favored over traditional varieties because they significantly lower production costs, offer more flexibility in crop management, and in many cases increase yields. According to USDA's March 31, 2003, *Planting Intentions Report*, 80% of the soybeans planted in the United States in 2003 will be RR varieties.

The Monsanto company is based in St. Louis, Missouri, but has offices throughout the world where it seeks to market its technology to agricultural producers. Since 1960, a total of 30 countries have approved Monsanto's RR soybean technology for import or planting.⁵ However, Monsanto has been unable to obtain patent protection in either Argentina or Brazil. In 1995, Monsanto's application for a patent for RR soybeans in

¹ U.S. Dept. of Agriculture (USDA), World Agricultural Outlook Board, "World Agricultural Supply and Demand Estimates," June 11, 2003.

² For more information on biotech-related issues, see CRS Report RL31970, *U.S. Agricultural Biotechnology in Global Markets: An Introduction*; and CRS Report RS21556, *Agricultural Biotechnology: The U.S.-EU Dispute*.

³ The patents on RR soybean technology expire on July 10, 2007. U.S. GAO, *BIOTECHNOLOGY: Information on Prices of Genetically Modified Seeds in the United States and Argentina*, GAO/RCED/NSIAD-00-55, January 2000, p.13.

⁴ The estimated technology fee is based on a comparison of GE versus non-GE soybean costs of production presented in the Iowa State University Extension publication, "Estimated Costs of Crop Production in Iowa — 2003," FM 1712, January 2003; and from discussions with experts from Iowa State University and the Iowa Grain Quality Initiative. The fee is usually embedded in the total seed cost and seed costs may vary with marketing margins and sales tactics, making the actual technology fee difficult to assess.

⁵ Testimony by Carl Casale, Vice President for Monsanto's North American Agricultural Business; given at Hearing of Senate Foreign Relations Subcommittee on Western Hemisphere, Peace Corps and Narcotics Affairs, May 20, 2003.

Argentina was rejected. Subsequent applications have not succeeded.⁶ In Brazil, the commercial status of GE soybeans (and GE crops in general) remains in dispute in the courts and no patents on RR technology have been issued. The status of GE soybeans in Brazil is particularly important to international oilseed markets since Brazil represents essentially the last potential major source for non-GE soybeans to world markets.

Universal Adoption of RR Soybeans in Argentina

Although RR soybean seeds are not patented in Argentina, Monsanto has agreements with other seed firms in Argentina allowing them to use the RR technology in their seeds. As a result, Argentine farmers have access to and have increasingly switched to RR soybean varieties. In 2001, about 90% of Argentina's soybean crop was planted to RR varieties.⁷ The RR share of the 2003 crop is nearly 100%, according to news reports.

An Argentine seed law (Act No. 20247; 1973) requires that all seeds must be certified for commercial use. However, Argentine farmers have reportedly ignored this law and routinely save RR soybean seeds for planting or resale. Since the government does not enforce this law, a large black market for RR soybeans in Argentina has developed that keeps seed prices low and discourages any attempts by Monsanto or licensed companies to assess technology fees on RR soybeans. According to Monsanto, it is not feasible to charge a technology fee on soybean seeds in Argentina without patent protection.⁸ As a result, Argentine farmers save about \$8 to \$9 per metric ton on the technology fee.⁹ This is a considerable cost advantage over U.S. soybeans in a highly competitive international soybean market.¹⁰

Status of GE Crops in Brazil Still in Flux

In September 1998, the Brazilian Biosafety Commission (CTNBio), acting under government authority, approved the commercial planting of RR soybeans. Two major groups opposed to the use of GE crops — Greenpeace and the Brazilian Consumer Defense Institute — immediately filed lawsuits in Brazilian courts challenging the CTNBio approval. In 1999 a lower court issued an injunction suspending the CTNBio approval of commercial planting of RR soybeans before any approved commercial

⁶ Monsanto appealed the initial patent rejection, and an Argentine court overturned the rejection. Monsanto has petitioned for reconsideration of the patent application; however, it appears to remain pending.

⁷ USDA, Foreign Agricultural Service (FAS). "Argentina Oilseeds and Products Annual," GAIN report #AR1027, May 8, 2001.

⁸ GAO (2000), p. 14.

⁹ Assuming a seeding rate of 75 kilograms (or 165.3 pounds) of RR soybean seed per hectare (ha) and a technology fee of \$7.44 per 50 pounds equals a technology fee of \$24.60/ha or about \$10/acre. A yield of 2.8 metric tons/ha (or 41.2 bushel/acre) gives a per metric ton fee saving of about \$8.79. The technology fee saving will vary with seed application rates and yields.

¹⁰ During 2002, soybeans traded in a price range of \$160 to \$215 per metric ton, FOB, Rio Grande, Brazil; \$158 to \$209 per metric ton, FOB, Buenos Aires, Argentina; and \$173 to \$225 per metric ton, FOB, Gulf Ports. Source: USDA, Foreign Agricultural Service, "Oilseeds: World Markets and Trade," Table 20, June 2003; and Republica Argentina, Ministry of Agriculture, Livestock, Fisheries, and Food (SAGPyA), [<http://www.sagpya.mecon.gov.ar/>].

planting actually occurred. The case was appealed to a three-judge panel of the Brasilia Appeals Court, where it has languished. In February 2002, the lead judge of the three-judge Appellate Court publicly announced in favor of commercial planting of RR soybeans. However, a majority of the three-judge panel has yet to render a decision on the commercial use of RR soybeans. As a result, it remains illegal to plant GE soybeans in Brazil. However, Brazilian farmers are aware of the benefits of RR soybeans and have reportedly smuggled seeds into Brazil from Argentina's black market. Despite the lack of government approval, 80% of the crop in the southernmost state of Rio Grande do Sul is estimated to be planted to RR soybean varieties.¹¹ USDA estimates that 10 to 20% of Brazil's total soybean crop may be planted to RR soybean varieties (trade estimates range as high as 30%).¹² As in Argentina, no technology fees are paid by RR soybean growers in Brazil.¹³ The American Soybean Association (ASA) claims that the technology fee savings for Brazilian growers ranges from \$9.30 to \$15.50 per acre depending on yields.¹⁴

More recently, other international events have forced the Brazilian government to temporarily alter its official position on GE soybeans. In June 2001, China — the world's leading importer of soybeans — issued controversial rules governing the use, sale, and importation of GE soybeans. Under the rulings, China will only accept GE soybeans that have been approved for export by the source country, along with certain other conditions. On January 10, 2003, China rejected Brazil's initial application to export GE soybeans, in part because Brazil does not officially recognize the domestic production and export of GE soybeans. In late March 2003, under pressure from producer groups, the Brazilian government announced temporary Regulation 113 (R113) as an interim measure allowing official sales of RR soybeans from the 2002-03 (April-March) crop for both domestic uses and export. R113 expires in March 2004, after which Brazilian growers are expected to comply with the current law.

Because Brazil's courts have been unable to resolve the crisis prior to this year's October-December planting period, the Lula government has been forced to issue a second temporary reprieve from the GE planting ban. Temporary Regulation 130 (R130), signed into law on September 25, 2003, approves the planting of GE soybeans for the 2003-04 growing season and extends the possible sale period of RR soybeans through December 2004. In an attempt to curb black market trade in RR technology, farmers seeking to sell GE soybeans during this period must sign a document pledging not to buy

¹¹ *Food Chemical News*, No. 33, Vol. 45, September 29, 2003, p. 20.

¹² USDA, FAS. "Brazil Oilseeds and Products Annual 2003," GAIN report #BR3003, March 10, 2003, p. 5.

¹³ The use of pirated RR soybean seeds reportedly has spread to Paraguay where an estimated 69% of soybean area is planted to RR soybeans. [*Food Chemical News*, No. 12, Vol. 45, May 5, 2003, p. 17.] Despite pressure from producer groups to legalize RR soybeans, Paraguay's agriculture minister has said that his country would wait and follow Brazil's lead on legalization of commercial GE crops. Paraguay is landlocked and dependent on roads through Brazil to reach international markets. A decision by Brazil against legalizing GE crops could pose serious marketing problems for Paraguay since transportation costs via Argentina are significantly more expensive and their use would likely lower the competitiveness of Paraguay's soybeans in international markets.

¹⁴ *Food Chemical News*, No. 34, Vol. 45, October 6, 2003, p. 6.

seeds of untraced origin in the future.¹⁵ In addition, Brazilian soybean farmers are limited to planting GE seed stocks already on hand because R130 contains no provision for importing or selling GE seeds in Brazil. Also, lack of any labeling protocol for GE crops is likely to complicate domestic marketing. The Lula government states that it is preparing a comprehensive “bio-safety law” to address these regulatory gaps, but this legislation has been slow to emerge. The Lula government remains split on this issue. The Minister of Agriculture favors prompt legalization, while the Minister of Environment is opposed and has asked for an environmental impact study before commercialization is allowed.¹⁶ Both ministers agree that rigid enforcement of existing regulations would mean the incineration of all GE crops and the imprisonment of growers for 1 to 3 years at great cost to the country’s agricultural sector.

Within Brazil, two principal camps argue against legalizing GE soybeans, but for very different reasons. Some consumer and environmental groups argue that, because the risks associated with GE crops are unknown, they should not be legalized. Peasant groups such as the Landless Workers Movement (MST), on the other hand, are not against GE crops per se, but argue that legalizing GE crops will accelerate large-scale farming and give control over Brazil’s agriculture to multinational corporations such as Monsanto.¹⁷

Brazilian producer groups claim that lack of access to RR technology would place them at a competitive disadvantage in international markets. To date, no significant market premium for non-GE soybeans has emerged in either domestic or international markets sufficient to offset the cost advantages of adopting GE varieties. Given the rapid growth and widespread use of GE soybeans, legalizing their commercial use may be the only viable solution for Brazil’s government.

GE Labeling in Brazil. Brazil’s food labeling regulation for products containing GE ingredients took effect on December 31, 2001.¹⁸ The law mandates the labeling of all foods for human consumption when more than 4% of the ingredients are derived from GE commodities. R113, the first temporary regulation allowing GE soybean planting, has imposed stricter GE labeling conditions on Brazil’s food marketing system. Under R113, non-GE soybeans are to be segregated with a 0% tolerance level from GE soybeans.¹⁹ In addition, labeling is required on all shipments into or out of Brazil with a GE soybean presence in excess of 1%.²⁰ Since improper labeling is subject to a severe fine, and since Brazil’s marketing system is not set up to handle such strict segregation requirements, it is likely that all soybeans passing through Brazil’s marketing system will have to be

¹⁵ Ibid.

¹⁶ *Food Chemical News*, No. 3, Vol. 45, March 3, 2003, p. 6.

¹⁷ *Inter Press Service*, Rio de Janeiro, Brazil, June 23, 2003.

¹⁸ USDA, FAS. “Brazil Oilseeds and Products Annual 2003,” GAIN report #BR3003, March 10, 2003, p. 38.

¹⁹ World Perspectives Incorporated, “Soybean Biotechnology Update,” April 1, 2003.

²⁰ *Food Chemical News*, No. 10, Vol. 45, April 21, 2003, p. 23. Argentina’s agricultural minister has expressed concern that the labeling requirement under R113 will raise production costs for Argentine producers whose primary market for corn, wheat, and many other agricultural products is Brazil. Argentina’s GE soybeans are processed into a wide range of exported food products. In addition, an important share of Argentina’s corn crop is planted to GE corn varieties.

labeled as having GE content. It is reported that Brazil's National Agriculture Federation (NAF) estimates the cost of testing the current 2002/03 crop for GE content at about \$277 million. The NAF says that passing this cost on to consumers would make it impossible for Brazil to remain competitive in the global soybean market.²¹

International Market Implications. According to many market analysts, the decision on the status of GE crops in Brazil will have significant market implications, especially for global soybean markets. First, if Brazil permanently legalizes GE soybeans, nearly all (about 90%) of the world's internationally traded soybeans will be of GE varieties. Second, a decision in favor of GE crops will be nearly irreversible because of mixing in the distribution and transportation systems. Some analysts suggest that the current widespread planting of GE crops in Brazil is already irreversible. In short, a decision in favor of GE soybeans by Brazil could do much to moot the debate about whether or not GE soybeans should be labeled or even traded because there simply would not be any major international supplier of non-GE soybeans left.

U.S. Perspective

According to the U.S. Trade Representative, the U.S. is committed to a policy of promoting increased intellectual property protection, both through the negotiation of free trade agreements that strengthen existing international laws and through use of U.S. statutory tools as appropriate.²² The U.S. Administration's position regarding GE crops is that, not only are food products made from GE crops as safe as their conventional counterparts, but their production has the potential to spur agricultural productivity while benefitting the environment.²³ Congress has generally supported this position. For example, both the Senate (S.Res. 154) and the House (H.Res. 252) have passed resolutions in support of the Administration's dispute settlement case at the World Trade Organization (WTO) brought against the European Union's ban on imports of GE crops.

In hearings by the Senate Foreign Relations Subcommittee on Western Hemisphere, Peace Corps, and Narcotics Affairs on May 20, 2003, to discuss opportunities for U.S. agriculture in agricultural trade negotiations in the Western Hemisphere, the IPR issue of RR soybean piracy in Brazil was raised in testimony given by the ASA and Monsanto.²⁴ In the absence of patent protection in Argentina or Brazil, accusations of IPR violation may be difficult to sustain in a court of law. However, both Argentina and Brazil are members of the WTO and, as such, have agreed to abide by the WTO agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement). As a result, if Monsanto were able to eventually obtain patent protection for the RR technology in either Argentina or Brazil, Monsanto could then seek recourse for IPR infringement via the legal systems of those countries per requirements of the WTO TRIPS agreement.

²¹ *Pesticide & Toxic Chemical News*, No. 25, Vol. 31, April 14, 2003, p. 38.

²² USTR, *2003 Special 301 Report*, May 2, 2003, p. 2.

²³ USTR, online resources: biotechnology, June 26, 2003, [<http://www.ustr.gov/new/biotech.htm>].

²⁴ Testimony by Bart Ruth, Chairman, ASA, and Carl Casale, Vice President for Monsanto's North American Agricultural Business; given at Hearing of Senate Foreign Relations Subcommittee on Western Hemisphere, Peace Corps and Narcotics Affairs, May 20, 2003.