



12 SOYBEAN MARKET



Soybeans serve a variety of functions in the global food chain, ranging from use as edible oil to a source of protein for humans to use in livestock feed. Globally, approximately 87 per cent of all soybean production is crushed into soy meal and soy oil, with the remaining 13 per cent used for direct human consumption. From the soybean crushing process, roughly 80 per cent is extracted as soy meal for use in animal feed,¹ and 20 per cent is extracted as oil for human consumption and as a biofuel feedstock (Product Board MVO, 2011). With such a large portion of soybeans produced for animal feed (approximately 70 per cent), demand growth for higher protein diets across the world is also having an important impact on demand and overall growth in soy production. In 2012 soybeans were produced on an estimated 2.2 per cent of the world's agricultural land, up from 1.5 per cent in the year 2000 (Food and Agriculture Organization of the United Nations (FAO), 2013). Most of this growth (79 per cent) occurred in South America (FAO, 2013).² Global production during the same year reached 253.1 million metric tons, with exports (whole beans only, not including meal and oil) worth US\$53.2 billion (see Figure 12.1 and Table 12.1).

Rapid market expansion in developing countries leading to deforestation and biodiversity loss (notably South America), along with the commodity's significant reliance on genetically modified

organisms (GMOs), has given rise to a host of sustainability concerns. Soy production systems range from smallholder production in China to large-scale, capital-intensive farming in Brazil and the United States. The diversity of production systems in the soy sector presents significant challenges for global standards. Voluntary standards in the soy sector are also challenged by soy's predominant role as an "intermediate" input in the food supply chain as livestock feed—leading to reduced opportunities for direct branding through consumer-facing labels. Notwithstanding, major international voluntary sustainability standards active in the sector and growing in popularity include the Danube Soya Initiative, Fairtrade, the Round Table on Responsible Soy (RTRS), ProTerra and Organic. The International Sustainability and Carbon Certification (ISCC)³ and the Roundtable on Sustainable Biomaterials (RSB) are other standards involved in the soybean industry (see Section 6).⁴ In total, 2.0 per cent of global production and 1.5 per cent of global exports were standard-compliant in 2012 (Organic, ProTerra and RTRS, as well as minimal volumes of Fairtrade; see Table 12.2). Brazil, China and Argentina were the largest standard-compliant producers; Figure 12.2 breaks this down by voluntary sustainability standard.

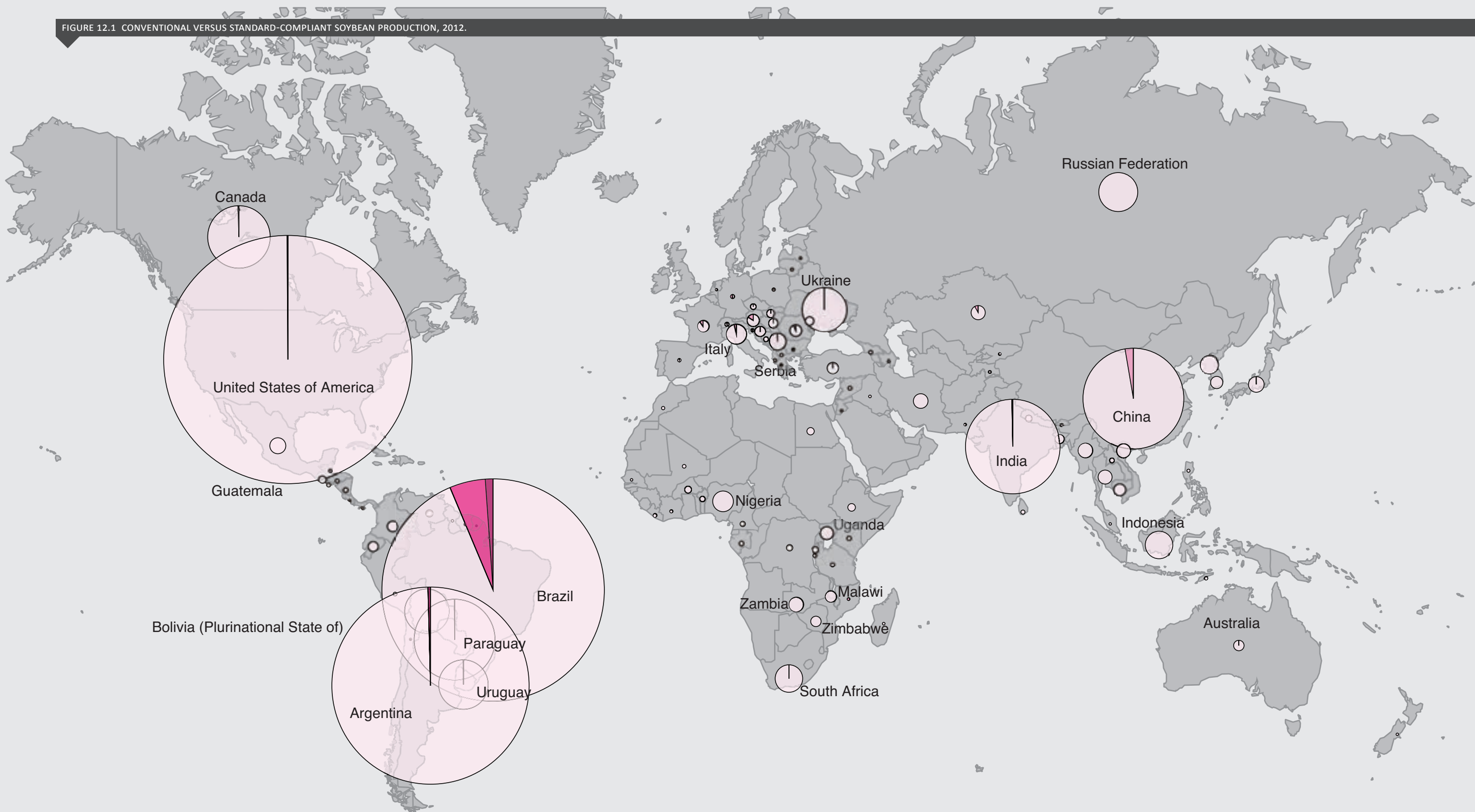
¹ Soybeans produce more protein per hectare than any other plant, making them a popular choice for high-protein, compound animal feed. Soybeans are also favoured for the quality of their protein—they are one of the few "complete" non-animal proteins, meaning that they contain all essential amino acids (Dutch Soy Coalition AIDEnvironment, 2006; Product Board MVO, 2011). In animal feed, grains are the primary carbohydrate source, while oil meals are used as the primary protein source. In the global consumption of oil meals, soybeans accounted for 61 per cent in 2010 (Product Board MVO, 2011).

² As measured by area harvested.

³ ISCC PLUS, which allows ISCC units to extend certification to food and feed products (ISCC, n.d.-b), was established in 2012 and will be covered in the next edition of the SSI Review.

⁴ RTRS also has a program geared toward the certification of soy as a biofuel feedstock in its RTRS standard, for compliance under the European Union's Renewable Energy Directive.

FIGURE 12.1 CONVENTIONAL VERSUS STANDARD-COMPLIANT SOYBEAN PRODUCTION, 2012.



Circle size represents total production volumes; coloured slices represent volumes of standard-compliant soybean production. Relative to total production, standard-compliant soybeans represent a small share of the market, at 2.0 per cent. Sales of standard-compliant soybeans were equivalent to 1.5 per cent of exports, an important consideration given that the vast majority of compliant production volumes are exported. Brazil is the second-largest producer of

soybeans next to the United States, and in relative and absolute terms produces the largest amount of compliant soybeans, largely due to the activity of ProTerra certification within the country. Sources: FAO, 2013; ProTerra, 2013; IISD, H. Willer, Research Institute of Organic Agriculture/Forschungsinstitut für biologischen Landbau (FiBL), personal communication, Aug 26, 2013; B. Zeelandelaar, F. Cativiela, RTRS, personal communication communication, February 28, 2013.

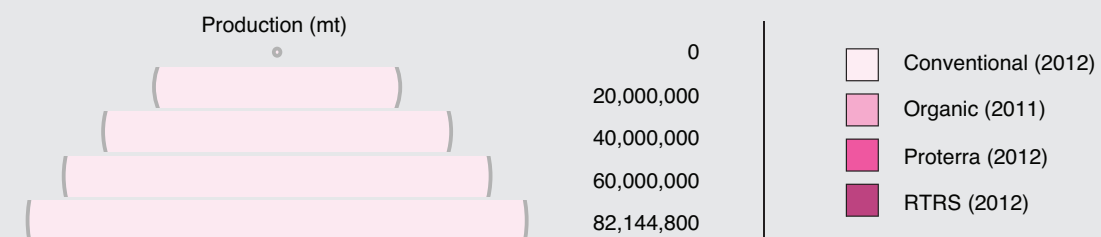
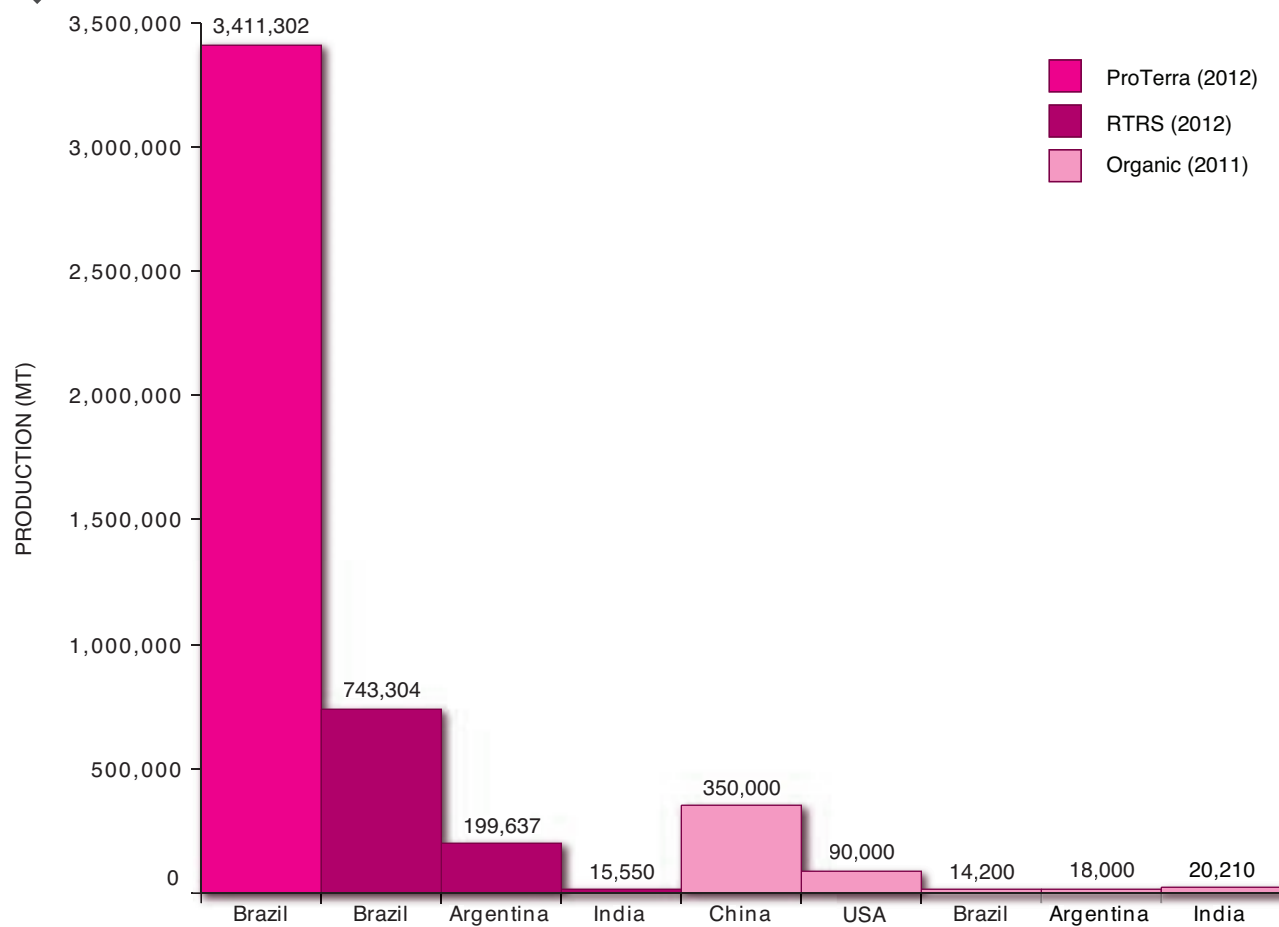


FIGURE 12.2 LEADING PRODUCERS OF STANDARD-COMPLIANT SOYBEANS BY VOLUNTARY SUSTAINABILITY STANDARD, 2012.



Sources: Freire, 2013; IISD, H. Willer, FiBL, personal communication, August 26, 2013; B. Zeehandelaar & F. Cativiela, RTRS, personal communication, February 28, 2013.



TABLE 12.1 STANDARD-COMPLIANT AND CONVENTIONAL KEY STATISTICS FOR SOYBEAN PRODUCTION AND TRADE.

KEY STATISTICS

Top 5 producers (88% of global) (2012)	United States (32%), Brazil (26%), Argentina (20%), China (5%), India (5%)
Top 5 standard-compliant producers (98% of global) (2011 and 2012)	Brazil (84%), China (7%), Argentina (4%), United States (2%), India (1%)
Top 5 exporters (92% of global) (2012)	United States (45%), Brazil (34%), Argentina (6%), Canada (4%), Paraguay (3%)
Top 5 importers (73% of global) (2012)	China (61%), Spain (3%), Germany (3%), Japan (3%), Netherlands (3%)
Global production (2012)	253.1 million metric tons
Global exports (2012)	159.0 million metric tons (63% of production)
Trade value (2012)	US\$53.2 billion
Global area harvested (2012)	106.6 million hectares (2.2% of all agricultural land)
Estimated total number of farmers involved in soybean production	5–6 million in India, 20 million in China (small-scale); South America, United States and Europe in the 100,000s
Major international voluntary sustainability standards	Danube Soya Initiative, Fairtrade, Organic, ProTerra, RTRS
Standard-compliant production (2011 and 2012)	5.0 million metric tons (2.0% of production)
Standard-compliant sales (2011 and 2012)	2.1 million metric tons (42% of compliant production, 0.8% of production, 1.3% of exports)
Key sustainability issues	Deforestation and biodiversity, pest management, soil erosion, land ownership rights, land use change within agriculture (example: natural grassland changed to monoculture of soybeans), GMOs

Sources: Top 5 producers, global production, global area under cultivation: F. Cativiela, RTRS, personal communication, February 28, 2013; FAO, 2013; Top 5 standard-compliant producers: FAO, 2013; Freire, 2013; IISD, H. Willer, FiBL, personal communication, August 26, 2013; B. Zeehandelaar, F. Cativiela, RTRS, personal communication, February 28, 2013; Top 5 exporters, top 5 importers, trade value: International Trade Centre, 2013c; Global exports (data include soybeans, soybean meal and soybean oil): U.S. Department of Agriculture, 2013e; Estimated total number of farmers (rough estimate): G. Van der Bijl, Solidaridad, personal communication, September 1, 2013; Standard-compliant production (2011 data for Organic, 2012 data for ProTerra and RTRS): F. Cativiela, RTRS, personal communication, February 28, 2013; Freire, 2013; IISD, H. Willer, FiBL, personal communication, August 26, 2013.



12.1 MARKET REVIEW



Market reach

Approximately 5 million metric tons of soybeans were standard-compliant in 2012 (see Figure 12.3), equivalent to 2.0 per cent of global production. Sales of compliant soybeans accounted for 1.5 per cent of exports.

Growth

Standard-compliant soy production grew at an average annual rate of 3.0 per cent from 2008 to 2012.

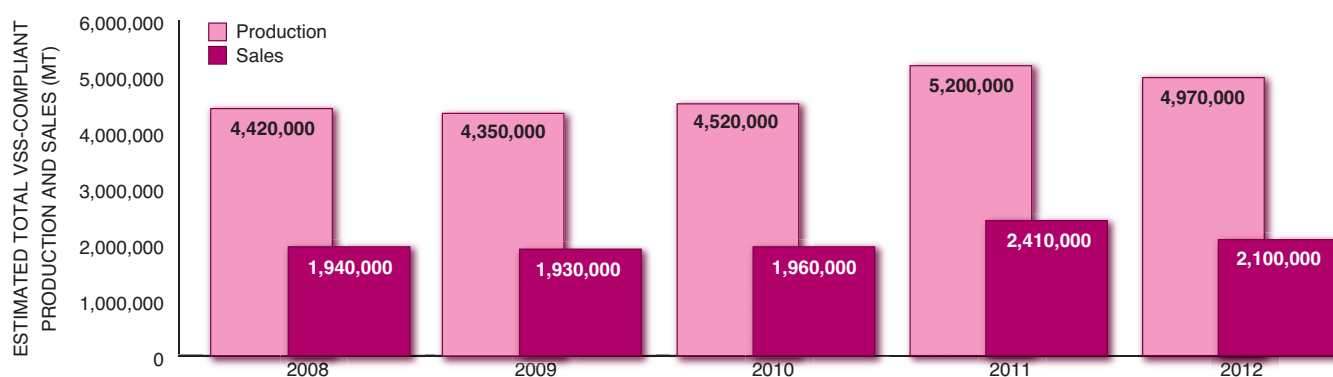
Regional importance

Brazilian standard-compliant soy comprises the vast majority of the market (84 per cent).

Pricing and premiums

Premiums for standard-compliant products ranged from an estimated 0.3 per cent to over 80 per cent. Highest premiums were estimated for Organic certified soybeans. The lowest premiums were estimated for RTRS certified soybeans.

FIGURE 12.3 GROWTH IN STANDARD-COMPLIANT SOY PRODUCTION AND SALES, 2008–2012.

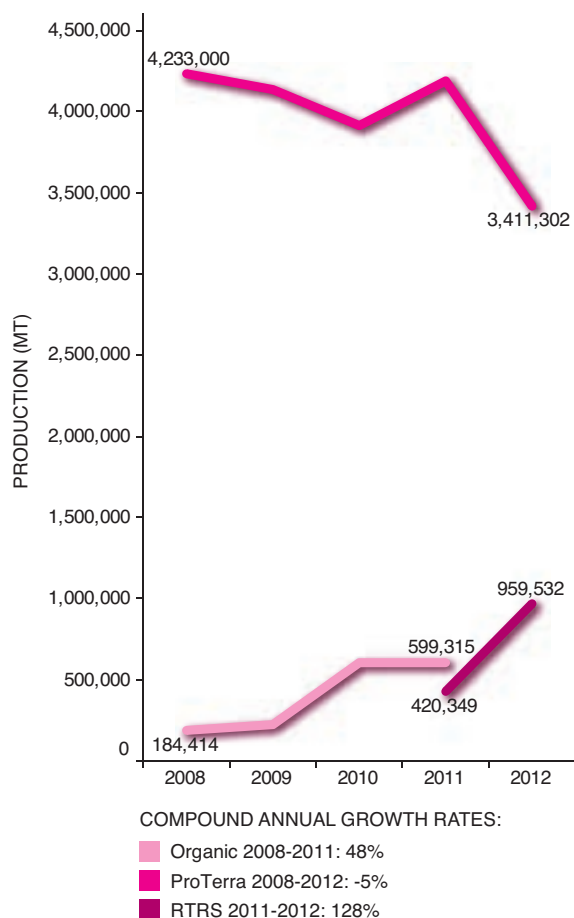


* ProTerra sales are based on the assumption that 42 per cent of ProTerra soybean production is sold as certified (a cross-sector average).

Sources: Freire, 2013; IISD, H. Willer, FiBL, personal communication, August 26, 2013; B. Zeehandelaar, F. Cativiela, RTRS, personal communication, February 28, 2013.

FIGURE 12.4 ORGANIC, PROTERRA AND RTRS SOYBEAN PRODUCTION, 2008–2012.

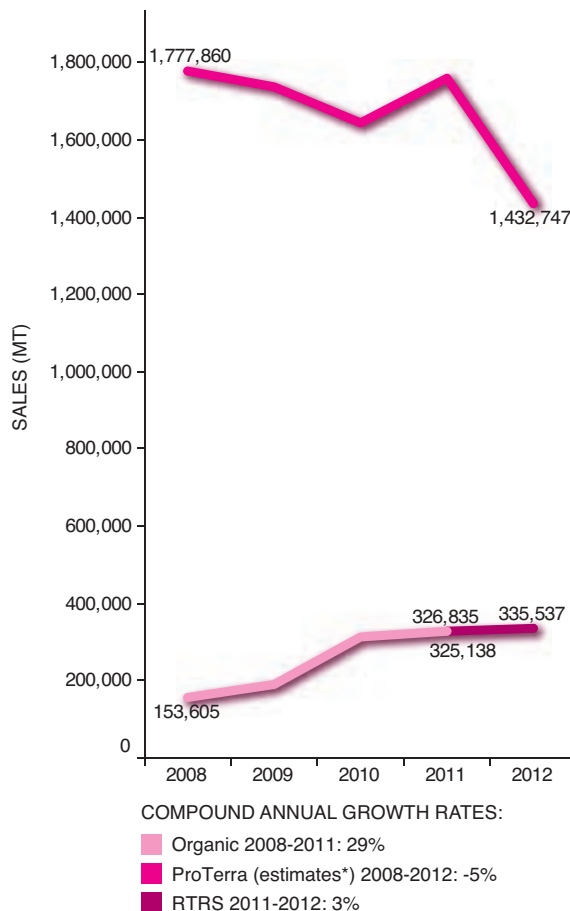
ProTerra certified roughly 4.0 million metric tons of soybeans per year from 2008 to 2012 globally, +/- 600,000 metric tons (2.5 per cent of exports). 2012 volumes saw an 18 per cent contraction from the year prior, due to heavy droughts in Brazil and a late confirmation of demand by EU buyers. RTRS expects certification to reach between 4 and 5 million metric tons by 2015, just over ProTerra's current certified volumes (3.4 million metric tons in 2012).



Sources: Freire, 2013; IISD, H. Willer, FiBL, personal communication, August 26, 2013; B. Zeelandelaar, F. Cativiela, RTRS, personal communication, February 28, 2013.

FIGURE 12.5 ORGANIC, PROTERRA AND RTRS SOYBEAN SALES, 2008–2012.

Fifty-six per cent of Organic and 35 per cent of RTRS-compliant production was sold as standard compliant in 2011 and 2012, respectively. Each voluntary sustainability standard had sold just over 300,000 metric tons as compliant, which is roughly equivalent to 0.2 per cent of 2012 global exports.



*ProTerra sales are based on the assumption that 42 per cent of ProTerra soybean production is sold as certified (a cross-sector average).

Sources: Freire, 2013; IISD, H. Willer, FiBL, personal communication, August 26, 2013; B. Zeelandelaar, F. Cativiela, RTRS, personal communication, February 28, 2013.



Soy production reached 253 million metric tons globally in 2012, with the United States, Brazil and Argentina responsible for more than 76 per cent of global production. Although soy originated in China and has traditionally been grown in temperate and subtropical regions, current expansion is being led by tropical regions, including in Brazil and Argentina. Over the past decade, global soy exports have grown by 100 per cent. In South America alone, it was originally estimated that the area committed to soy production would double, by 2020, from 2000 production levels (Dros, 2003); by 2012, it had already done so (FAO, 2013).

As a direct result of the growing demand for soy, there has been a parallel growth in the social and environmental threats imposed by more intensive soy production, particularly in the new growth areas in South America. Some analysts have estimated that 90 per cent of the growth over the past decade, and moving forward until 2020, will rely on the removal of natural forest vegetation (Dros, 2003). Meanwhile, the use of genetically modified soy plants has resulted in increases in the use of chemical inputs in many of the major soy producing countries, thus adding additional stress to the ecosystems proximate to soy production areas.⁵ The current growth of voluntary standards in the soy sector represents the merging of these two principle pre-occupations, land transformation and the widespread use of GMO production.

The five major international sustainability standards active in the sector are the Danube Soya Initiative, Organic, Fairtrade, ProTerra and RTRS. The RSB and ISCC⁶ also publish standards for biofuel feedstock, including soy (for more information on the biomaterials standards, see Section 6).

Organic soy, which has been available since the 1970s, focuses on the preservation of soil and eco-system health through, among other things, the avoidance of agrochemical inputs. National Organic standards are developed at the national and/or regional level through relevant Organic standard setting bodies. Organic production, although voluntary, stands out among the different standards in the soy sector as being the only certification system directly regulated by national policy.

Prior to the release of GMO soy by Monsanto in 1995, the most recognized sustainability issues in the soy sector arguably related to the use of pesticides. Consequently, Organic certification existed as the sole provider of standard-compliant soy to the global market until 2000. Although Fairtrade soy also became available during 2008 (Fairtrade Labelling Organizations (FLO), 2008), the quantities

were small, being largely limited to the use of soy as an ingredient in Fairtrade chocolate.

The arrival of GMO soy has led to a radical transformation of the marketplace. Genetically modified soy is now, in most countries, the dominant source of production,⁷ accounting for 81 per cent of world plantings and 98 per cent of U.S. production in 2012. Within the context of increasingly widespread application of GMO soy, many countries have established technical requirements related to the labelling of GMO products, most of which are carried out independent of any given sustainability labelling process.⁸

Although Organic and Fairtrade standards prohibit the use of GMOs, and the growing expansion of GMO soy around the world has arguably given these initiatives another point of differentiation on conventional markets, their niche status has largely prevented them from taking full advantage of more popular concerns about GMO production generally. At the same time, with GMOs becoming increasingly ubiquitous within the sector, non-GMO-based efforts to address sustainability at the mainstream level face serious supply constraints and limits on total growth.⁹

It was within this context that the WWF launched its Forest Conversion Initiative in 2001 and began directing the world's attention to the effect of rapidly expanding soy production on the Amazonian forests. As a result of WWF's campaign, land conversion quickly became a second driver of sustainability initiatives within the sector. This was reflected through the ensuing development of the "Basel Criteria for Responsible Soy" in 2004, itself the product of a collaborative effort between WWF Switzerland and the Swiss retailer Co-op, among others.¹⁰ The development of the Basel Criteria, and growing attention to forest conversion issues within the soy sector more generally, eventually led to the development of two additional sustainability standards within the sector.

In 2004, Cert ID began the development of the ProTerra certification program, based on the Basel Criteria. The first audits to this standard were carried out in 2005, and the first ProTerra certified material was shipped to Europe in 2006. The standard

5 Glyphosate is used in higher concentrations and with greater frequency on genetically modified soy. There is substantial evidence of human poisoning from the use of glyphosate (Benbrook, 2009).

6 ISCC is a dominant standard for soybean certification serving the biofuel feedstock sector. The ISCC model is very flexible and includes a Chain of Custody that recognizes all other European Union Renewable Energy Directive-approved systems (including RTRS). The ISCC PLUS standard was recently published—in 2012—and allows producers under the ISCC-EU or ISCC-DE (Germany) standards (for biofuel use) to convert to certified feed or food (ISCC, n.d.-b).

7 GMO cotton is grown in 11 different countries and accounted for 81 per cent of global plantings in 2012. Of the four major biotech crops (soy, cotton, maize and canola), soybeans and cotton had the highest relative presence of biotech, and soybeans had the highest absolute presence of biotech hectareage in the world (FAO, 2013; International Service for the Acquisition of Agri-Biotech Applications (ISAAA), 2012b).

8 One major driving factor for certification from a historical perspective has been certain countries' cautious stances and trade policies on GMOs (one early example being the CERT ID Non-GMO certification program established in 1998). The European Union, Japan, Australia and New Zealand, for example, all implement pre-market approval processes for GMOs, and all but Japan have implemented mandatory labelling of GMOs (American University, n.d.).

9 It should be noted that in countries like China and India, virtually no soy crop is GMO. In Brazil, 20 to 25 per cent of soy production is non-GMO (Freire, 2013).

10 See "Basel Criteria for Responsible Soy Production" at <http://wwf.panda.org/?16872/The-Basel-Criteria-for-Responsible-Soy-Production>.

includes requirements related to conservation of high-value conservation areas, worker welfare, avoidance of certain pesticides, and protection of traditional land use. Drawing from established markets for non-GMO products, ProTerra was able to rapidly bring compliant production to 4.5 million metric tons by 2007. Since then, certified production under the ProTerra standard has remained relatively stable, at around 4 million metric tons.

In 2006 RTRS was established through the combined efforts of NGOs and major manufacturers and traders including Gruppo Maggi, WWF, Cordaid, Co-op, Fetro-sul, and Unilever. Fuelled by its aspirations to be a vehicle for mainstream “market transformation” toward improved sustainability, RTRS distinguished itself by adopting a permissive approach to the use of GMO soy within its system. RTRS finalized its standard in 2010 and was first implemented by soy producers in 2011, with Dutch, Belgian, English and Scandinavian traders and processors buying the first RTRS certified soy in 2011 (Sustainable Trade Initiative/Initiatief Duurzame Handel (IDH), n.d.-a). In addition to its position on GMO production, RTRS also differs from other sustainability standards in that its Chain of Custody certification operates largely through book-and-claim and

mass balance systems, allowing for reduced supply chain costs but also in some cases affecting the claims that can be made at the retail level.¹¹ Although the total sales volumes of RTRS soy in 2012 were only 353,000 metric tons, they more than doubled the following year, reaching 900,000 metric tons in 2013 (J. Fagan, ProTerra, personal communication, December 12, 2013), and the standard is positioned to become an important supplier of standard-compliant soy within the coming years.

Most recently, the Danube Soy Initiative was launched in 2012 as a “mainstream” vehicle for providing access to non-GMO soy for EU markets.¹² Although it is the newest of the initiatives in the soy market, the Danube Soy Initiative has shown signs of potential for significant growth and uptake, with significant support coming from stakeholders in Germany, France, Austria, Luxembourg and the United Kingdom (see Box 12.1).

11 For more information on Chain of Custody certification, see the short video Effective Chain-of-Custody and Traceability (ISEAL, 2012a).

12 The Danube Soya Initiative will be formally covered in the next edition of the SSI Review.

BOX 12.1 THE DANUBE SOYA INITIATIVE AND PRESSURE FOR NON-GMO IN EUROPE

There is a relatively new movement among some European retailers, including REWE Group, Lidl, Edeke in Germany, Carrefour in France, and many of the retailers in Austria, along with Waitrose in the United Kingdom, toward moving significant production of livestock and animal and poultry products (dairy, eggs, etc.) to use non-GMO feed. The production systems of various retailers are at different stages of transition, but very influential players, like REWE, are well on their way to full conversion and are making public commitments to full transition within a reasonably short period of time. These commitments are putting pressure on the soy supply chain to support this transition. The Brussels Soy Declaration (AllAboutFeed.net, 2013), which supports non-GMO soybean production in Brazil, is one channel through which the retailers are working to support transition in the sustainable soy supply chain (J. Fagen, ProTerra, personal communication, December 19, 2013).

A more in-depth route through which the retailers and major manufacturers are supporting the transition to non-GMO for animal production is their current effort to foster the development of new sources of non-GMO and sustainable soy in addition to existing South American sources. The most prominent of these initiatives, which has the strong financial and political support of German, French and Austrian retailers, major manufacturers and government officials, is the development of non-GMO, sustainable soy production in Eastern Europe under the Danube Soya Initiative. Because customers, retailers and manufacturers have signalled a commitment to non-GMO products, the

livestock industry has also linked to this initiative (J. Fagen, ProTerra, personal communication, December 19, 2013). This was the context for the signing of the Danube Soya Declaration in September 2012 (Danube Soya, 2012) by 17 industry experts and policy-makers, thus forming the Danube Soya Association.

The Danube Soya Initiative (the Association’s corresponding platform) focuses on non-GMO compliance but also requires conformity with basic sustainability indicators; it is undergoing rapid growth as a source of sustainable and non-GMO soy for Europe. Because the Danube River is navigable with barges and is linked to a network of canals and rivers that reaches throughout Europe, certified Danube Soy can be viewed as “low-carbon soy” because the carbon dioxide generated in delivering Danube Soy to the European end user is significantly lower than that generated in delivering South American or North American soy to these markets.

While the Danube Soy has unique sustainability features as a local source of non-GMO soy for EU farmers and retailers, it nevertheless faces significant hurdles in light of current market dynamics. As of 2011, the EU imported an estimated 72 per cent of its protein feed needs with the vast majority coming from the U.S., Argentina and Brazil (whose production bases, as of 2009, were estimated to be 91 per cent, 99 per cent and 69 per cent GMO soy, respectively) (EuropaBio 2011). Reversing the current market trend toward *increased* reliance on GMO feed sources by European farmers will likely require not only leadership from retailers, but also support from policy-makers.

Since 2006, ProTerra has consistently certified 3 million metric tons or more of soy in Brazil, making it the current market leader for standard-compliant soy (see Figure 12.4). In 2012 ProTerra volumes shrank 18 per cent from 2011 volumes, largely due to heavy droughts in Brazil. Although not all of these production volumes are actually sold as ProTerra-compliant (this is true with all voluntary sustainability standards covered in this section and is due to a variety of factors, including limited demand for compliant product—see Figure 12.3, Figure 12.4 and Figure 12.5 for more information on the gap between production and sales of standard-compliant product in the soy sector), ProTerra soybeans accounted for 69 per cent of total standard-compliant production globally in 2012, with Organic and RTRS certifying 12 per cent and 19 per cent, respectively. Although the amount of certified ProTerra beans is expected to increase to over 4 million metric tons again in 2013, planned diversification to China and India will help boost supply, especially in the European Union.

While most standard-compliant soybeans were certified under the ProTerra standard in 2012, RTRS and Organic sourced their soybeans from a wider variety of countries. During 2012, most Organic soybeans came from China and Canada, and RTRS soybeans came from Brazil, Argentina and a small portion (2 per cent) from India. Notwithstanding, the vast majority of standard-compliant soy came from Brazil in 2012 (84 per cent). Organic soybeans could also see an expansion in Brazil within the coming two or three years, as the country has considerable hectareage under conversion to Organic soybeans, although it remains unclear whether demand will keep up with supply, particularly given the dynamic nature of the market.

One major unknown for voluntary sustainability standard activity in the soy sector is the expansion and uptake of RTRS. Without the limits on supply faced by the other voluntary sustainability initiatives, RTRS has an important potential for expansion. RTRS projects that production volumes will reach between 4 and 5 million metric tons by 2015, with new programs to be developed in China. The WWF, on the other hand, cites a target of 25 per cent of global soy production (e.g., between 60 and 70 million metric tons) of responsible soy certified by 2020 (WWF, n.d.-b). Achieving either of these objectives will require significant commitment and integration of RTRS within

supply chains beyond current levels.¹³ Regardless of whether or not RTRS is able to ramp up production to projected values by 2015, the demand (sales) of certificates would have to increase substantially to maintain some sort of equilibrium in the market for credits. As of 2012, about two-thirds of compliant production remained unsold.

Other important actors in the sustainable soy sector are the sustainable biomass and biofuel standards, including, as previously mentioned, ISCC¹⁴ and RSB (see Section 6 for more detail). ISCC is a holistic biomass standard with an emphasis on greenhouse gas emissions and a major standard for gaining compliance for import into the European Union under the Renewable Energy Directive. The ISCC Chain of Custody recognizes all other European Union Renewable Energy Directive-approved systems (including Bonsucro, RSB, RTRS and RSPO). This flexibility in its Chain of Custody has helped ISCC become a major actor in the certification of soybeans as a biofuel feedstock. RSB is another potential certifier of soybean feedstock, although the standard is still in its infancy with only seven certificates issued by mid-2013.

In aggregate, 5.0 million metric tons of soybeans were standard-compliant in 2012 (Organic, ProTerra, RTRS, and very minor volumes of Fairtrade soybeans), which is equivalent to 2.0 per cent of global soybean production (or 3.1 per cent of global soybean exports). We estimate that 2.1 million metric tons (42 per cent of certified production) were sold as certified in 2012, equivalent to 0.8 per cent of production and 1.3 per cent of exports (see Table 12.2).

13 WWF includes Proterra and RTRS certified soy, among others, as examples of sustainable soy for the purposes of its target.

14 As noted earlier, ISCC PLUS, which allows ISCC units to extend certification to food and feed products (ISCC, n.d.-d), was established in 2012 and will be covered in the next edition of the SSI Review.

12.3 MARKET PERFORMANCE



TABLE 12.2 IMPORTANCE OF VOLUNTARY SUSTAINABILITY STANDARD (VSS) SOY BEAN PRODUCTION AND SALES RELATIVE TO THE GLOBAL MARKET.

	VSS production (mt)	VSS production market share of global production	VSS production market share of global exports	VSS sales (mt)	VSS sales market share of global production	VSS sales market share of global exports
Organic	599,315	0%	0%	326,853	0%	0%
ProTerra	3,411,302	1%	2%	* 1,432,746	1%	1%
RTRS	959,532	0%	1%	335,537	0%	0%
Global VSS production / sales (mt and %)	4,970,000	2%	3%	2,100,000	1%	1%

* Assumes that 42 per cent of ProTerra soybean production is sold as certified (a cross-sector average).

Sources: FAO, 2013; ProTerra, 2013; U.S. Department of Agriculture, 2013e; IISD, H. Willer, FiBL, personal communication, 2013; B. Zeehandelaar, F. Cativiela, RTRS, personal communication, February 28, 2013.

Fairtrade International

Fairtrade International certifies soybeans under its combinable crops standard. In 2010 there was only one soybean producer organization certified, so data were not reported. As of 2011, soybeans were being reported by Fairtrade International within the aggregated “Oilseeds and Oleaginous Fruit” category, which represented 8,800 farmers certified and 300 metric tons in sales volume in 2011. With real soy prices hovering at some of their highest levels since the mid-1980s, farmers may be less incentivized by the Fairtrade premium as they are in other agricultural sectors.

International Federation of Organic Agriculture Movements (IFOAM, or “Organic”)

In 2011 Organic certified soybeans were produced in 31 countries and accounted for an estimated 600,000 metric tons of soybeans produced globally, or about 0.2 per cent of total world production. Of total certified volumes, an estimated 56 per cent were sold as certified (90 per cent are sold as certified outside of China), with remaining volumes sold as conventional (see Figure 12.7 and Table 12.4). The total harvested area for certified Organic for soybeans cultivation represented 278,000 hectares, or about 0.3 per cent of total world area under cultivation.

In the last three years (since 2008), reported estimates of Organic soybean production and harvested area have more than tripled, with an average annual growth rate of 48 per cent, although this is largely due to an incorporation of Chinese volumes into the statistics for the first time in 2010. It can be assumed that the Chinese were producing Organic certified soybeans prior to this, in which case growth rates in production volumes would be relatively flat in recent years. FiBL expects that the area and production for

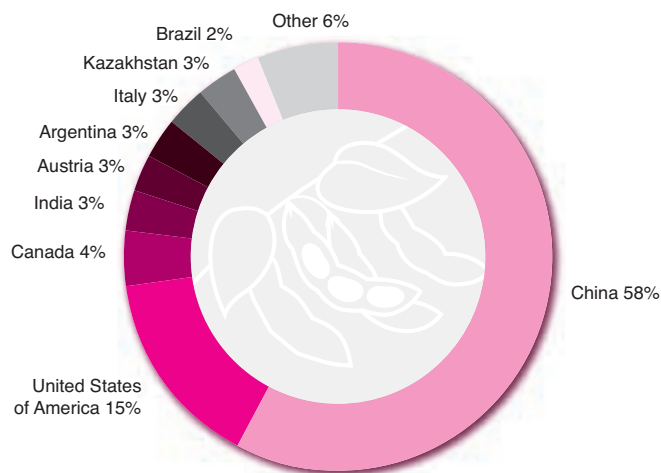
Organic soybeans will grow moving forward, partly due to an EU regulation on organic farming that will require that 100 per cent of protein feedstuffs for monogastric animals (e.g., poultry) be of organic origin in the near future (European Commission, 2012b). Because the European Union is the second-largest Organic market, it is expected that the implementation of this regulation will have an important impact on the future supply and demand of Organic soybeans for feed. FiBL expects that much of the supply growth to feed this demand will occur domestically within the European Union as the Union aims to diminish the dependency on Organic soy from China and other exporting countries.¹⁵

Of the voluntary sustainability standards involved in soybean certification, Organic certified soybeans are sourced from the most geographically diverse set of countries. Seven countries account for 90 per cent of certified Organic production: China (58 per cent), the United States (15 per cent), Canada (4 per cent), India (3 per cent), Austria (3 per cent), Argentina (3 per cent) and Italy (3 per cent) (see Figure 12.6 and Table 12.3).¹⁶

15 One area where this is occurring is Germany. The German Federal Ministry for Agriculture is funding a large project on soy production (organic and non-organic) in order to optimize crop production and processing technology for soy (Wilbois, 2012). The project, “Improved Contribution of Local Feed to Support 100% Organic Feed Supply to Pigs and Poultry,” is a collaboration of 15 partners across 10 European countries that will bring together an extended knowledge of different local feeds and their wider impact on growth, health and welfare, and the environment to identify feeding strategies that comply with organic principles (ICOPP, 2011).

16 Rounding accounts for the discrepancy between the sum of values (89 per cent) and the 90 per cent total figure.

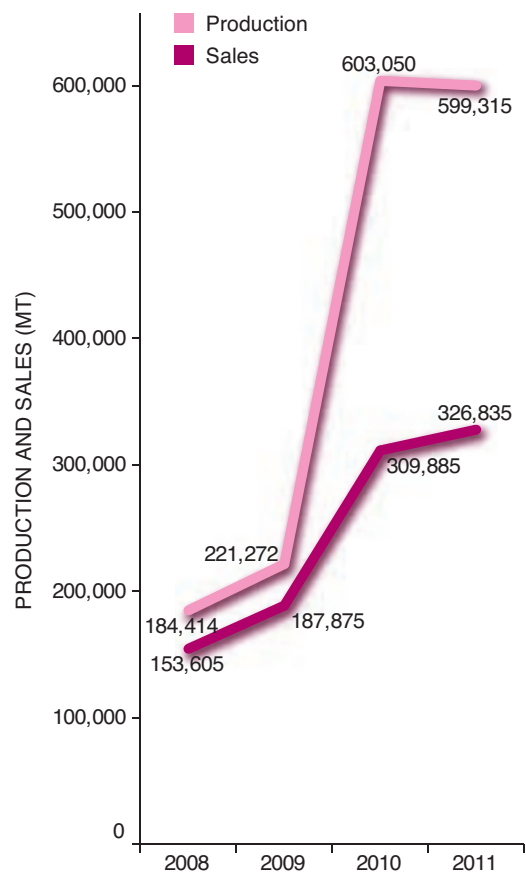
FIGURE 12.6 ORGANIC SOYBEAN PRODUCTION BY COUNTRY, 2011.



Source: IISD, H. Willer, FiBL, personal communication, August 26, 2013.



FIGURE 12.7 ORGANIC SOYBEAN PRODUCTION AND SALES, 2008–2011.



Source: IISD, H. Willer, FiBL, personal communication, August 26, 2013.

TABLE 12.3 ORGANIC SOYBEAN PRODUCTION, SALES AND AREA HARVESTED, BY COUNTRY, 2011.

	Production (mt)	Sales (mt)	Area harvested (ha)
Argentina	18,000	16,000	8,600
Australia	80	70	50
Austria	19,772	17,800	7,100
Brazil	14,200	12,800	5,400
Bulgaria	69	60	50
Canada	24,600	22,000	13,000
China	350,000	107,000	150,000
Croatia	122	100	50
Czech Republic	55	50	30
France	11,157	10,000	7,400
Germany	2,160	1,900	1,100
Greece	80	70	50
Hungary	779	700	700
India	20,210	15,000	16,000
Italy	15,768	14,200	4,600
Japan	939	600	700
Kazakhstan	15,014	13,500	5,900
Lithuania	191	170	300
Mozambique	263	200	200
Paraguay	4,300	3,300	1,800
Poland	5	5	4
Romania	7,300	6,500	6,600
Serbia	220	200	100
Slovakia	330	300	360
Slovenia	13	10	10
South Africa	30	30	30
Spain	56	50	50
Switzerland	130	120	60
Turkey	572	500	150
Ukraine	2,900	2,600	1,600
United States	90,000	81,000	46,000
Total	599,315	320,685	277,994

Source: IISD, H. Willer, FiBL, personal communication, August 26, 2013.

TABLE 12.4 ORGANIC SOYBEAN AREA HARVESTED, PRODUCTION AND SALES, 2008–2011.

	Area harvested (ha)	Production (mt)	Sales (mt)
2008	98,091	184,414	153,605
2009	115,651	221,272	187,875
2010	270,952	603,050	309,885
2011	277,994	599,315	320,685

Source: IISD, H. Willer, FiBL, personal communication, August 26, 2013.

ProTerra

ProTerra certified soybeans account for the largest volumes of soybeans of the major voluntary sustainability standards active in the sector, with 3.4 million metric tons certified in Brazil in 2012 (see Table 12.5), or 5.2 per cent of total Brazilian soybean production and 6.4 per cent of Brazilian exports. The volume of soybeans certified in 2012 represented 1.3 per cent of total world production and 2.1 per cent of exports. ProTerra's strict non-GMO stance accounts for the organization's current concentration in Brazil, as the country is one of the only large exporters with significant amounts (20 to 25 per cent) of non-GMO soy.

Although volumes certified dipped slightly in 2012 due to droughts in Brazil (see Figure 12.8), ProTerra asserts that an additional 1.5 million metric tons could have been certified if EU buyers had expressed their demands earlier in the year. The organization asserts that new adoption of the standard by several producers in Brazil and strong demand in the European Union will push certified volumes to over 4 million metric tons again in 2013.

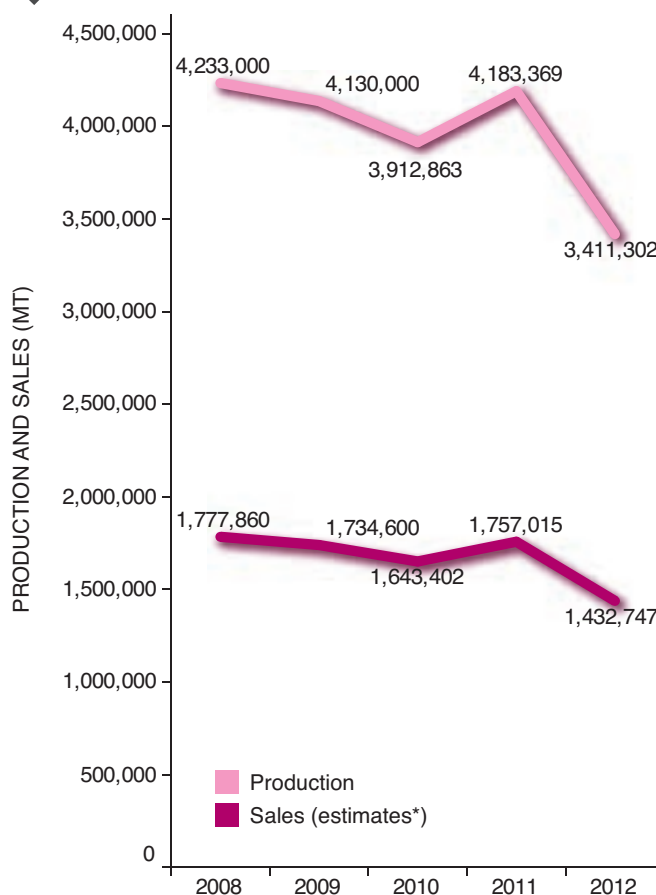
Round Table on Responsible Soy (RTRS)

The year 2011 saw the first RTRS certified soy producers and the first produce sold on the market to companies in Europe, of which the largest purchasers were the Cefetra Group, the Stichting Project Ketentransitie–Verantwoorde Soja (Ex IDS), and Lantmännén. Unilever Brasil and Shell Trading Rotterdam B.V. also purchased RTRS soy that year.

RTRS production volumes have increased two-fold, from 420,000 metric tons to 960,000 metric tons between years 2011 and 2012 (128 per cent growth; see Figure 12.10 and Table 12.7), accounting for 0.4 per cent of global soy production by 2012. Over 2011 and 2012, sales remained stable—around 330,000 metric tons during the same time period, accounting for 0.1 per cent of global production.

However, RTRS expects certified volumes to reach between 4 and 5 million metric tons by 2015, driven by buyer commitments. In December 2011, for example, several Dutch companies¹⁷ agreed to achieve 100 per cent use of “responsible soy” (defined in the agreements as compliant with RTRS standard or equivalent¹⁸) for the production of meat, dairy, eggs and other foods in the Netherlands by 2015. These companies are preparing to purchase increasingly large volumes of “responsible” soy: 1 million metric tons in 2013 and 1.5 million metric tons in 2014, representing 0.4 per cent and 0.6 per cent of 2012 world production volumes. An estimated €7

FIGURE 12.8 PRODUCTION AND ESTIMATED SALES GROWTH OF PROTERRA SOYBEANS, 2008–2012.



* Assumes that 42 per cent of ProTerra soybean production is sold as certified (a cross-sector average).

Source: Freire, 2013.

million in investments are needed to achieve this transition, and the participating companies have agreed to finance half of this amount, with IDH agreeing to finance the other half (IDH, 2011a). Such investments should allow growers in South America and other supply chain actors to implement the necessary improvements and achieve RTRS certification. Reaching WWF's target of 25 per cent of global production as “responsible” soy by 2020 will require even further investment and remains largely uncertain at this point in time. Achieving this objective will almost certainly depend on RTRS's ability to expand production (and demand) to other regions around the world.

The RTRS standard is currently mainly active in Argentina and Brazil, which represent 98 per cent of total RTRS production volumes. India represents the remaining 2 per cent, with very small amounts in Paraguay and Uruguay (see Figure 12.9 and Table 12.6). Brazil alone accounts for 77 per cent of total RTRS production volumes.

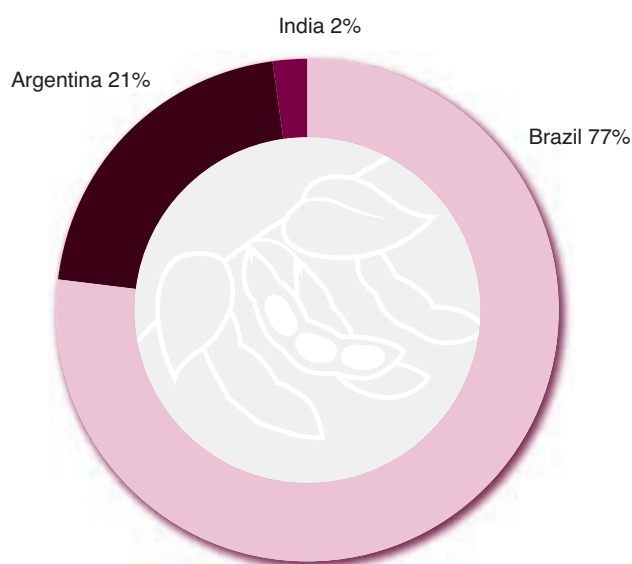
17 These companies represent the food industry and trade sectors and include Nevedi (the Dutch Feed Industry Association), IDH, Friesland Campina and other members of the Dutch Dairy Association, the Dutch Meat Association, Dutch retailers Albert Heijn, C1000, Jumbo, Lidl, SuperUnie, LTO Nederland, the Product Board for Poultry and Eggs and the Product Board for Margarine, Fats and Oils.

18 RTRS and ProTerra are currently engaged in a mutual harmonization process that will result in ProTerra certified soy being recognized as “responsible soy” (J. Fagen, ProTerra, personal communication, December 12, 2013).

TABLE 12.5 VOLUMES OF PROTERRA SOYBEANS IN BRAZIL, 2005–2011.

Year	Volume (mt)
2005	1,500,000
2006	4,000,000
2007	4,550,000
2008	4,233,000
2009	4,130,000
2010	3,912,863
2011	4,183,369
2012	3,411,302

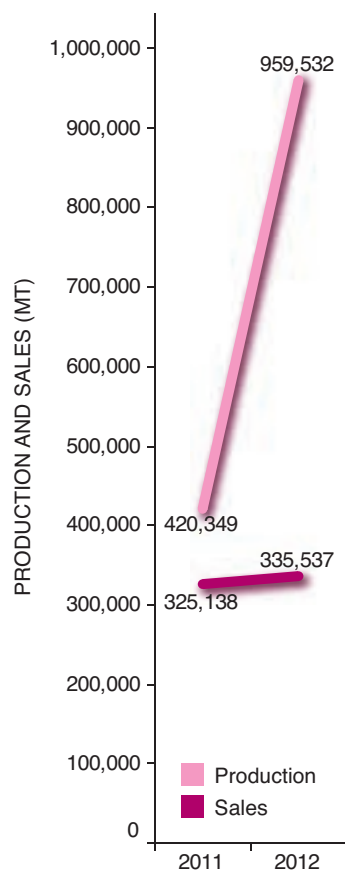
Source: Freire, 2013.

FIGURE 12.9 RTRS SOYBEAN PRODUCTION BY COUNTRY, 2012.¹⁹

Sources: B. Zeelandelaar, F. Cativiela, RTRS, personal communication, February 28, 2013.

¹⁹ RTRS certified production in Uruguay is less than 1 per cent.

FIGURE 12.10 RTRS SOYBEAN PRODUCTION AND SALES, 2011–2012.



Sources: B. Zeelandelaar, F. Cativiela, RTRS, personal communication, February 28, 2013.

TABLE 12.6 PRODUCTION, AREA HARVESTED AND SALES OF RTRS SOYBEANS BY COUNTRY, 2012.

	Production volume (mt)	Area harvested (ha)	Sales (mt)
Argentina	199,637	81,212	157,570
Brazil	743,304	224,691	166,191
India	15,550	10,904	11,776
Uruguay	1,041	372	0

Sources: B. Zeelandelaar, F. Cativiela, RTRS, personal communication, February 28, 2013.

TABLE 12.7 VOLUMES, AREA HARVESTED AND SALES OF RTRS SOYBEANS, 2011–2012.

	Production volume (mt)	Area harvested (ha)	Sales (mt)
2011	420,349	146,932	325,138
2012	959,532	317,178.5	335,537

Sources: B. Zeelandelaar, F. Cativiela, RTRS, personal communication, February 28, 2013.



12.4 SUPPLY



As of 2012, standard-compliant soybeans can be sourced from a large number of countries due to the wide coverage of organic schemes; however, the RTRS and ProTerra standards have penetrated only a handful of countries, and the vast majority (84 per cent; see Figure 12.14) of all compliant production currently occurs in Brazil (versus 26 per cent of total production; see Figure 12.13). Looking at the top 20 soybean producing countries in the world (Table 12.8), only Brazil has a sustainability intensity of higher than 5 per cent (6.3 per cent), due to ProTerra's and RTRS's coverage of the Brazilian market. The closest second—in terms of sustainability intensity—of the top 20 countries is Italy, where 3.7 per cent of soybeans are certified Organic.

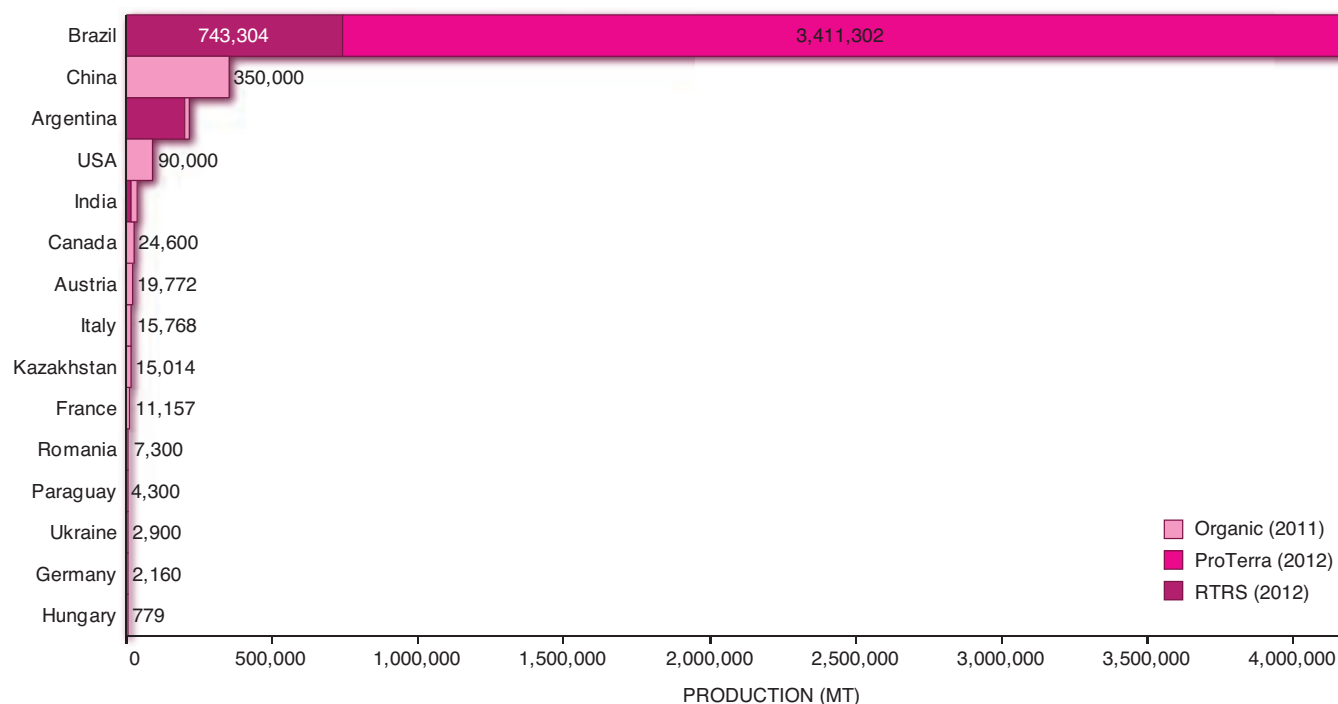
Notably, RTRS production is not currently available in the United States and China, two of the largest producers of soybeans in the world (see Figure 12.11), and with ProTerra volumes certified in Brazil, South America is currently by far the dominant producer of soybeans certified by a voluntary sustainability standard (see Figure 12.12). Although Organic soy is present in these two countries, only 0.1 per cent of total soybean production in the United States is certified Organic, while about 2.7 per cent is certified Organic in China. In the case of several minor producing European and Asian

countries such as Germany, Kazakhstan, Austria, Bulgaria and France, Organic certification levels range from 5 per cent to 95 per cent.

However, production volumes and land areas of standard-compliant soybeans have, almost without exception, increased for all international voluntary sustainability standards active in the soy sector in recent years²⁰ and it is expected that compliant volumes will generally continue to increase across all countries moving forward. The RTRS saw the largest year-over-year increase between 2011 and 2012, with 128 per cent growth in compliant production volumes. Organic production more than tripled between 2008 and 2011 (2012 data are not yet available). Over the last five years, ProTerra certified volumes have remained relatively stable, while Organic-compliant production is on a continuous upward trend, growing at about 29 per cent every year since 2008. Finally, the establishment of the Danube Soy Initiative in 2012 promises to reinforce this trend of growth in the volumes and diversity of standard-compliant soy supply in coming years.

²⁰ The one exception being ProTerra, which experienced a decline in production between 2011 and 2012 due to climatic conditions in Brazil.

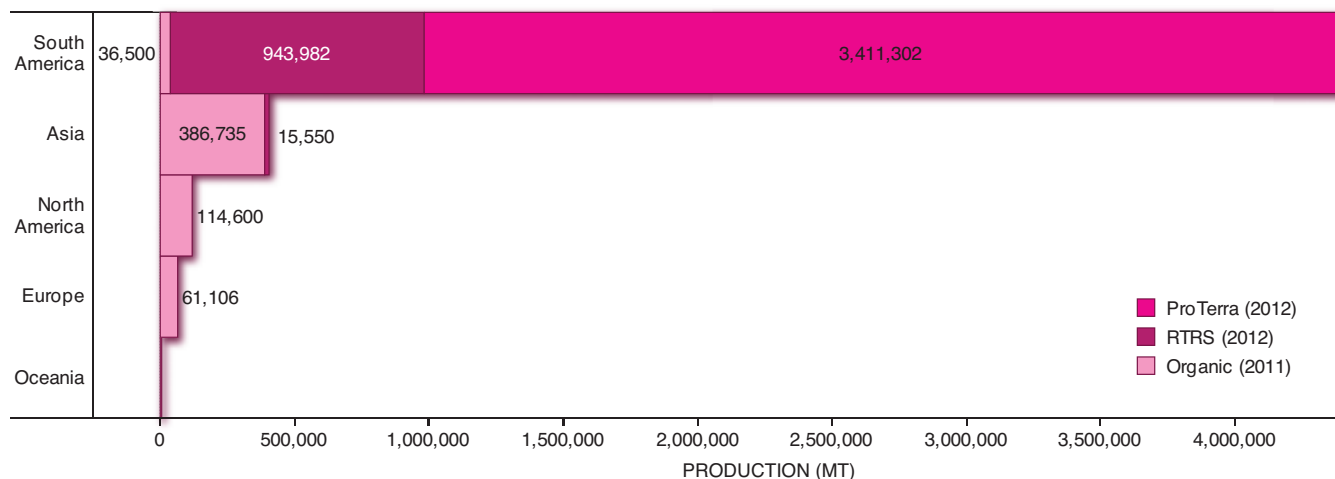
FIGURE 12.11 LARGEST STANDARD-COMPLIANT SOY PRODUCERS BY COUNTRY, 2012.



Where space permits, data points are visible.

Sources: Freire, 2013; IISD, H. Willer, FiBL, personal communication, August 26, 2013; B. Zeehandelaar, F. Cativiela, RTRS, personal communication, February 28, 2013.

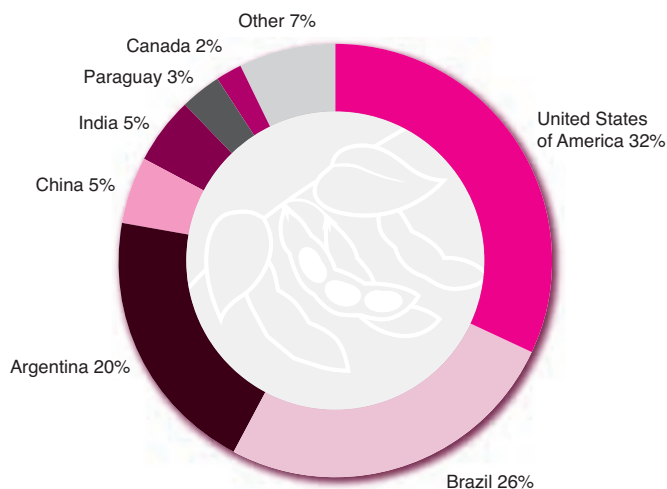
FIGURE 12.12 STANDARD-COMPLIANT SOY PRODUCTION BY CONTINENT, 2012 (2011 DATA FOR ORGANIC).



Where space permits, data points are visible.

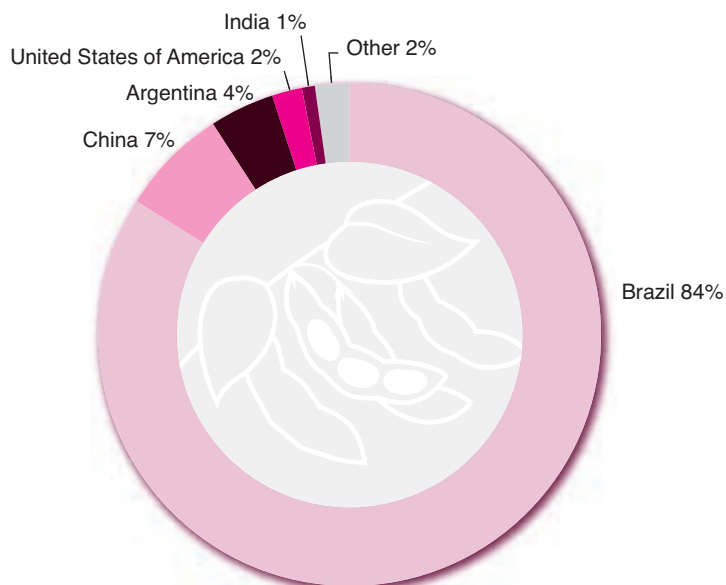
Sources: Freire, 2013; IISD, H. Willer, FiBL, personal communication, August 26, 2013; B. Zeehandelaar, F. Cativiela, RTRS, personal communication, February 28, 2013.

FIGURE 12.13 TOTAL (STANDARD-COMPLIANT AND CONVENTIONAL) SOYBEAN PRODUCTION BY COUNTRY, 2012.



Source: FAO, 2013.

FIGURE 12.14 STANDARD-COMPLIANT SOYBEAN PRODUCTION BY COUNTRY, 2012 (2011 DATA FOR ORGANIC).



Sources: Freire, 2013; IISD, H. Willer, FiBL, personal communication, August 26, 2013; B. Zeehandelaar, F. Cativiela, RTRS, personal communication, February 28, 2013.

TABLE 12.8 LARGEST PRODUCERS OF STANDARD-COMPLIANT SOY PRODUCTION AS A PERCENTAGE OF TOTAL NATIONAL PRODUCTION, FOR 20 LARGEST SOYBEAN PRODUCERS.

Dashes represent negligible or no standard-compliant production relative to national production.

	Organic	ProTerra	RTRS	Total
United States	0.1%	-	-	0.1%
Brazil	-	5.2%	1.1%	6.3%
Argentina	-	-	0.4%	0.4%
China	2.7%	-	-	0.4%
India	0.2%	-	0.1%	0.3%
Paraguay	0.1%	-	-	0.1%
Canada	0.5%	-	-	0.5%
Uruguay	-	-	-	-
Ukraine	0.1%	-	-	0.1%
Bolivia	-	-	-	-
Russian Federation	-	-	-	-
Indonesia	-	-	-	-
South Africa	-	-	-	-
Nigeria	-	-	-	-
Italy	3.7%	-	-	3.7%
Democratic People's Republic of Korea	-	-	-	-
Serbia	0.1%	-	-	0.1%
Mexico	-	-	-	-
Japan	0.4%	-	-	0.4%
Myanmar	-	-	-	-

Sources: FAO, 2013; Freire, 2013; IISD, H. Willer, FiBL, personal communication, Aug, 26, 2013; B. Zeehandelaar, F. Cativiela, RTRS, personal communication, February 28, 2013.



Premiums for standard-compliant soybeans have been estimated to range from 0.3 per cent for some RTRS certified soybeans to over 80 per cent for Organic soybeans.²¹ With the relative difficulty in procurement of non-GMO seed and the costs and time associated with conversion to compliant production for certain standards (three years in the case of Organic, for example), it is likely that premiums for non-GMO standards Organic and ProTerra will remain upwards of 25 per cent for the foreseeable future. It remains to be seen what will happen to RTRS premiums as production and demand ramp up in the coming years, although current analysis suggests that RTRS supply chains are willing to support premiums of around 0.3 per cent (US\$1.5 per metric ton) for soy and 0.7 per cent to 0.9 per cent (US\$3 to \$4 per metric ton²²) for soy meal (KPMG, 2013). Premiums for certified soy oil may be higher still, with refiners in the European Union receiving a tax rebate for using soy oil to produce biodiesel. Premiums for RTRS soybeans are not fixed, however, and another industry source has estimated that premiums can be expected to generally fall between 0.4 and 1.5 per cent (€1.50 and €5²³) in the

coming years.²⁴ Regardless, with current industry commitments, it is likely that demand can be expected to grow significantly in the coming two years due to commitments by the Dutch and Belgian soy industries to source 100 per cent RTRS soybeans by 2015. This should support current premium levels until 2015.

Premiums for ProTerra certified soybeans are estimated at 20 to 25 per cent (J. Fagen, ProTerra, personal communication, December 12, 2013) or US\$100 per metric ton, although about 90 per cent of the premiums come from ProTerra's non-GMO status, while the additional 10 per cent is for the ProTerra standard itself. About 30 per cent of the total trade premium makes it back to the farmer (A. Freire, personal communication, November 21, 2013). Organic soybean premiums are anywhere between 59 and 89 per cent (€200–€300).²⁵ Although the production and sales for Fairtrade soybeans are very small, the organization sets premiums of US\$35 per metric ton and US\$50 per metric ton for double-certified Fairtrade/Organic soybeans. These figures represent premiums of 7 per cent and 10 per cent over current market prices.

21 Based on Chicago Soybean Futures contract of US\$503 per metric ton in September 2013 (IndexMundi, 2013c).

22 Percentages calculated based on Chicago Soybean Meal Futures price of US\$490 per metric ton in September 2013 (IndexMundi, 2013c).

23 To calculate percentage premium, these figures were converted to U.S. dollars using the EUR/USD exchange rate of 1.38 on October 29, 2013.

24 Rough estimates (G. Van der Bijl, Solidaridad, personal communication, September 1, 2013).

25 Rough estimates (G. Van der Bijl, Solidaridad, personal communication, September 1, 2013).





12.6 CHALLENGES AND OPPORTUNITIES

Considering only RTRS's projected growth in its own compliant production by 2015, it is likely that volumes of standard-compliant soybeans will more than double within the next three years, reaching around 4 per cent of global soybean production. However, it remains to be seen whether supply from voluntary sustainability standards will be embraced as a major vehicle for mainstream supply as in other leading commodity sectors.²⁶ Sustainability standards in the soybean industry face several significant hurdles, including weak market demand for "sustainable" soy, supply constraints (particularly for non-GMO standards), and a poorly diversified production base.

Soy remains a largely invisible ingredient incorporated within other products. The market position of soy contrasts significantly with other commodities where voluntary sustainability standards have had successful mainstream adoption, such as coffee and cocoa, which are largely marketed without significant transformation. As a result, demand for standard-compliant soy can be expected to rely heavily on manufacturers and policy-makers, and perhaps less upon consumers (KPMG, 2013). However, for standards prohibiting the use of GMOs, consumer sentiment regarding the topic should be an important driver of compliant uptake, especially in countries where GMO labelling is mandatory such as Australia, New Zealand, and members of the European Union. Non-GMO soybeans are gaining traction in the European Union, and the push for non-GMO certified soybeans from European consumers, governments and industry is a positive development for future Danube, ProTerra, Organic and Fairtrade soy sales.

Demand for standard-compliant GMO soybeans also seems to be healthy, and support through NGO campaigns such as the Soy Fast Track Fund²⁷ will help ensure growth in supply moving forward, while other European commitments to standard-compliant sourcing should keep demand strong over the medium- to long-term. With the Dutch and Belgian industry having committed to sourcing all of its soy as "responsible" by 2015 and IDH's goal of 10 to 15 per cent of EU imports compliant under the RTRS standard by 2015, growth in voluntary sustainability standards within the sector in coming years should be strong, especially considering the impressive hurdles that these standards have had to navigate within the sector.

Notwithstanding the growing demand for responsible soy, it is important to note that China remains one of the most important producers and importers of soy production globally. As changing demographics within China increase its importance in the global soy market, the absence of Chinese demand for responsible soy points towards an important, and potentially growing gap in the more generalized market growth strategy for responsible soy.

Assuming demand for certified soy does grow as predicted by many, all of the initiatives will have to invest intentionally in the expansion and, perhaps even more importantly, the diversification of supply. At present, virtually all standard-compliant soy is sourced from Latin America, with the overwhelming majority of this coming from Brazil. More significant penetration in global markets will almost certainly depend on securing significant standard-compliant supply from other major producing countries such as the United States, Canada and China. For the standards initiatives prohibiting the use of GMO soy, the prospects for growth remain significantly constrained due to the ubiquity of GMO production. China and Brazilian production do, however, remain important opportunities for expanding supply for these initiatives at present.

²⁶ As, for example, in the coffee and cocoa sectors, which currently account for 40 per cent and 22 per cent of global production, respectively.

²⁷ The Soy Fast Track Fund is a joint initiative of IDH and Solidaridad that provides matching funds to private investments aimed at expanding sustainable soy production in High Conservation Value areas; see IDH (2011b).



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