



Crop Protection South America Monthly Report

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Editor's Note

South America is an important and growing market in the global context of agrochemicals. In 2012, the sales value of agrochemicals in the Brazilian market was USD9.4 billion, an increase of 10.5% compared with 2011. The Brazilian agrochemical sector is optimistic with bumper crop in 2013. It's expected that the prices of corn and soybean will give growth to agrochemical business here in the country. Farmers know that they need to invest in agrochemicals to produce more and with higher quality.

In the context of South America, including new product launches, the South American countries

showed several changes in the regulation of agrochemicals market, making stiffer or giving greater security to the market and its consumers through new practices of application or new evaluations of the effectiveness and toxicity of products already registered.

Furthermore, it was observed that there is a concern in decreasing the impact of the use of pesticides on the environment. The Chilean government, for example, is investing in the development of organic pesticides to protect citrus trees; Argentina follows the same scenario with the development of organic pesticides to protect the country's wine industry;



whereas Brazil changed rules for aerial application of certain pesticides to protect bees. In this sense, monitoring, not only of market situation, but also the perception of the final consumer about

agrochemicals, since they have great influence in shaping policy, constitutes an important strategic tool in the introduction or evolution of these products in the regional market.

Headlines

The year 2012 showed a positive scenario in the agrochemicals market in Brazil.

The Brazilian market for organic products will gain many investments by the Federal Government and FIFA which may pose a threat to agrochemical industry.

With lower production cost, in 2013, the Brazilian market may gain competitiveness against its main rival, China.

In the first week of Jan. 2013, a project to develop a mycoinsecticide was announced in Chile to protect citrus fruit production in the country.

The forecast of growth of weeds resistant and tolerant to herbicides generates preoccupation of producers in Argentina.

Argentina may consume 4.5 million tonnes to 4.6 million tonnes of fertilizer by 2015.

In Dec. 2012, a project of law about the minimum application of pesticides was presented to the Chamber of Deputies of Argentina.

The Chamber of Deputies of Brazil is evaluating the *Project of Law No. 4.412/12* that restricts the use and supply of technical and formulated products.

The traceability of waste and agrochemicals container may be soon a reality in Brazil.

In Dec. 2012, the Norwegian fertilizer company Yara International announced the acquisition of the fertilizer business of Bunge Brazil at a cost of USD750 million.

South America's GM industry continued to develop fast in 2012.

In Dec. 2012, Argentina presented a new method of combating the "grapevine moth", based on an insect pathogenic fungus.

In Nov. 2012, SENAVE alerted factories in banana producing areas in Paraguay before the threat of plague Black Sigatoka (*Mycosphaerella fijiensis*) that is widely distributed in 14 Brazilian states.

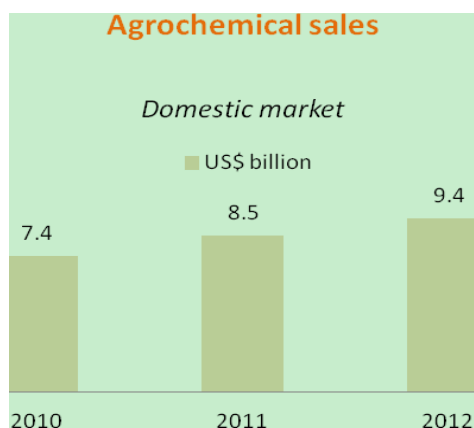
According to the analysis of MAPA, projections of production and consumption of rice will lead to increased imports of the product.



■ Market Situation

Brazilian crop production market becomes more mature in 2012

The year 2012 showed a positive scenario in the agrochemicals market in Brazil. Sales of agrochemicals increased by over 72% between 2006 and 2012, growing from 480,100 tonnes to 826,700 tonnes, according to the Sindag - National Union of the Industry of Agricultural Defense Products. For comparison, 748,500 tonnes of agrochemicals were sold in Brazil in 2011. According to Amaury Sartori, vice-president of Sindag, the prices of commodities and the high remuneration of farmers had influence in the increase, since the agribusiness is giving a good financial return and it's stimulating the farmers to make important investments on agrochemical field.



Source: Globo Rural Magazine

However, some events did not show such good results. In April 2012, during the 2nd Seminar of Agrochemicals Market and Regulation, in Brasília, ANVISA - National Agency for Sanitary Vigilance indicated that about 50% of all pesticides registered in Brazil are not made available to the farmers. Furthermore, it was noted that 24% of pesticides companies installed in Brazil did not produce or commercialize any products during the 2010/2011 season. An interesting fact is that 53% of agrochemical companies installed in the country do not have factories.

And among this market, the Brazilian government has made

some adjustments to the rules about the sales of agrochemicals in Brazil. In May 2012, Federal Prosecutor filed a civil action requesting the deregistration of all fungicides using the active prochloraz, because of the indication that the substance promotes the onset of breast cancer, testicular and prostate cancer. However, the 14th Civil Federal Court of São Paulo denied the request. The Federal Prosecutor is appealing to the Federal Regional Court of São Paulo to try to ensure the suspension of these fungicides.

The Federal Prosecutor said that currently there are three registered products using prochloraz as the active ingredient, such as Jade produced by Milenia Agrociências SA; Mirage 450 EC, produced by Agricur Defensivos Agrícolas Ltda.; Sportak 450 CE, produced by Bayer SA.

In July 2012, the *Instruction No. 14*, published in the Diary of the Union, established that the labels should contain pesticide toxicology colored band. The deadline for adaptation was until Dec. 2012.

There were also trading license suspensions of some pesticides in the country. In Oct. 2012, sales of the insecticide Diamante BR (Imidacloprid) produced by the company Ourofino Agronegócios, and the fungicide Locker (Carbendazim + Tebuconazole + kresoxim-methyl) produced by FMC Química do Brasil, were banned after the Ministry of Agriculture published the suspension of Toxicological Assessment Report. The ban was made after complaints that these products come to market without going through the mandatory assessment of ANVISA before being registered in the MAPA - Ministry of Agriculture, Livestock and Supply.

In the case of aldicarb, a pesticide that is used illegally as domestic rodenticide in Brazil, it was banned in Nov. 2012 by ANVISA. With the ban, the production, sale and use of any pesticide based on this product are prohibited in Brazil.

According to government estimates, aldicarb was responsible for almost 60% of the 8,000 cases of poisoning related to pellet in Brazil every year. Aldicarb has the highest toxicity among all active ingredients of pesticides previously approved for use in the country. The only aldicarb that had authorization to use in Brazil was Temik 150 from Bayer SA.

In 2012 the decision was also disclosed that the aerial spraying of pesticides containing imidacloprid, clothianidin, fipronil and thiamethoxam was authorized until June 2013 for rice, sugar cane, soybeans and wheat under conditions such as packages containing pesticide label or brochure supplement with a sentence stating that the product is toxic to bees. The restriction affects more than 50 products containing one of the four active ingredients.

In Jan. 2012, ANVISA published new criteria for registering pesticides in Brazil. Studies on pesticide residues in food, prepared by companies to register products in the country, must meet similar methodologies to internationally adopted ones. Criteria for sample preservation, presentation of stability study of pesticides in crop curve and dissipation are

some of the criteria established by ANVISA in order to ensure enhanced driving safety analysis of pesticide residues in food.

Returning to the positive scenario, the Brazilian fertilizer market showed a growth scenario in 2012 when nearly 30 million tonnes of the product were delivered to the final consumers, representing an increase of 4.5% over 2011.

The state of Mato Grosso had the highest volume of deliveries of fertilizer in 2012, reaching 4.95 million tonnes, an increase of 13% compared to 2011.

And finally, more than 31,600 tonnes of pesticide containers were collected and treated properly, according to Inpev - National Institute for Processing Empty Containers. This amount represents an increase of 6% compared to 2011 in the collection of the product in Brazilian territory, ie 80% of the packaging of agrochemicals in Brazil are recycled.

2014 world cup may challenge Brazilian agrochemical market

Although it's not a subject of discussions in the agrochemical industry, sporting events can pose a threat to the sector. With a growth rate of 20% per year, the Brazilian market for organic products will gain investment by the Federal Government and FIFA - Fédération Internationale de Football - for the 2014 World Cup.

In Nov. 2012, the campaign Brasil Orgânico e Sustentável was launched, which promotes inclusion of organic products in the food of the 12 host cities for the World Cup in Brazil. It is estimated that this campaign can benefit some 400,000 families of farmers, traditional peoples, extractive, riparian and maroon.

The National Policy for Agroecology and Organic Production, established by the Federal Government in Aug. 2012, aims to

expand the current number of 200,000-300,000 families involved with production bases in organic and agroecological until 2014.

So despite that Brazil is a major consumer of pesticides, it also has been consolidating as a consumer of organic foods. The sales amount in organic sector in the country reaches \$ 250 million annually and, according to FIEP - Federation of Industries of Paraná, this amount is expected to double by 2014. Brazil already has a culture of fitness; the exercise aimed at the beauty of the body, along with the World Cup, naturally helps boost demand for organic products that assist in aesthetics and health. It is common to see the launch of new products in the absence of pesticides in Brazilian supermarkets.



Thus, the 2014 FIFA World Cup presents itself as an opportunity for the organic industry and a threat to non-organic industry plant based on a SWOT analysis. The event is already being used as a way to speed up the whole set of public policies that give positive results for the rural producer that adheres to the organic chain.

One of the goals of the organization of the World Cup in Brazil is to leave as a legacy of sporting event a production chain of organic structured in the country, from the producer of the raw material, through agribusiness and retail markets, raising consumer awareness about the benefits of sustainable products and without pesticides.

There are already approximately 300 certified producers in the state of Rio de Janeiro within the process of fair trade, organic agriculture and certification of origin. Moreover, the Union of Hotels, Bars and Restaurants in Rio de Janeiro reported that the demand for organic products is high and already identified more than 30 hotels, bars and restaurants working only with organic products.

According to the president of the Agricultural Research Corporation of the State of Rio de Janeiro, Silvio Galvão, the city of Rio de Janeiro will be prepared for the challenge of encouraging the production and consumption of organic products. He says the need now is more technical, more opportunities for technology transfer to farmers.

On Jan. 4, 2013, the president of Brazil, Dilma Rousseff, said that the federal government has several policies to

encourage the production and consumption of organic foods, such as Pró-Orgânico – Program of Development of Organic Agriculture developed by the Ministry of Agriculture, and also stated that the Brazilian government purchase of food produced without pesticides.

The 2014 FIFA World Cup comes as an ally to those who advocate the preservation of the environment and non-use of pesticides in agriculture. The companies in agrochemical sector should be mindful of the needs of the population and consumption trends of new businesses that have been stimulated by the various levels of the Brazilian government, since Brazil wants to be seen on the international scenario as a sustainable country, which concerned with the environment, as the world could see in Rio +20 - United Nations Conference on Sustainable Development. This may be one of the strategies of the federal government to promote the country before the 2014 World Cup and 2016 Olympic Games.

From a cultural standpoint, it is important to emphasize the negative image that agrochemicals have to Brazilian final consumer, given the large number of poisonings caused by misuse of these products in crops, irresponsibly or illegally. The adoption of new sales strategies and promotion of responsible use of agrochemicals, as a way to increase production and product quality, are equally valid for both to promote products and to promote the corporate image, making use of practices of environmental and social responsibility, which are highly valued by Brazilian consumers.

More competitiveness to Brazilian glyphosate

In 2013, the Brazilian market may gain competitiveness against its main rival, China. At least, the competitiveness occurs on the glyphosate market, the most widely used herbicide in Brazil.

The expectation of Brazilian industry is that the glyphosate produced in Brazil has a lower cost of production in 2013,

according to the Brazilian TV channel, Canal Rural. However, the market price will continue rising, as domestic production is relatively small, and imports prevail. This trend of rising prices is usually felt after 3 or 4 months in the domestic market, reaching the final consumer, the farmers.

With a lower cost of production of glyphosate in Brazil, the



Brazilian industry gains in competitiveness in foreign markets. For example, the lower production costs and the lower cost of logistics in exports to Argentina, a country that consumes 50% of Brazilian agrochemicals, make Brazilian glyphosate very competitive in Argentina. These factors, together with the monetary, fiscal and exchange rate policies adopted by the Brazilian government, create competitive advantage and encourage industries already present in the Brazilian market to reverse the logistics flow, importing less and less of their foreign affiliates and developing new poles of production in country.

From 2008 to 2011, Brazilian industries have been dedicated to develop strategies to ameliorate the impacts of Chinese glyphosate in Brazil. As a consequence of the very low prices that reached the Brazilian ports, the Brazilian government has stipulated the minimum value of around USD3.60/kg of the product. For comparison, the Brazilian glyphosate had their prices around USD12.00/kg. As a result of remarkable competitiveness of Chinese enterprises, some other companies exited the market.

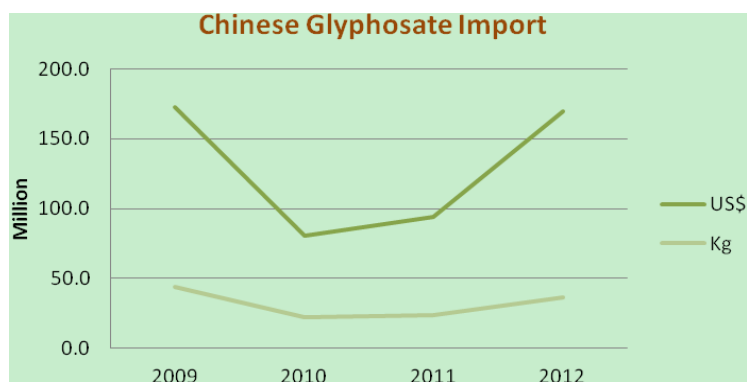
Monsanto, the reference in the glyphosate in Brazil, also felt the impact of Chinese glyphosate industry and had to reduce its operational capacity by 20% in the state of Bahia, state located in northeastern region, where it has the largest production unit of raw material. Furthermore, Monsanto cogitated to stop the glyphosate production in Brazil and start importing from the US, forcing the Brazilian government to reassess the policies of foreign trade and hinder the

presence of Chinese glyphosate with prices of difficult competition.

Based on consultations on Aliceweb – System of Information Analysis of Foreign Trade of Brazilian Ministry of Development, Industry and Foreign Trade, using the glyphosate with tax classification (NCM - Mercosur Common Nomenclature) 3808.93.24, 2931.00.39 and 2931.90.32, it's possible to observe that Brazilian import volume and import value (USD FOB) of Chinese glyphosate decreased by 17.24% and 1.44% respectively from 2009 to 2012.

However, as can be seen in the graph below, from 2010, imports began to increase and, compared to the scenario seen in 2012, the Chinese industry is still gaining the Brazilian market. Precisely in this period when the anti-dumping measures started, the import value of Chinese glyphosate increased considerably.

The anti-dumping measures started on May 26, 2010. The rate of 2.1% was replaced by a new standard, and with the implementation of the new standard, a tariff with the maximum of USD2.52/kg would be applied to make up the spread between the regular price of the product and the price of Chinese exports to Brazil. The product imported from China, whose average price is higher than USD3.60/kg, does not pay the anti-dumping duty.



Source: Aliceweb - MDIC



In an interview in Dec. 2012 with the Canal Rural, Gilmar Gerard, director of the Plant at Monsanto in Camaçari, Bahia state, said the company's strategy is to simplify the portfolio after a review of brands that it has in the Brazilian market and invest in research and development, improving processes forward to Chinese competition.

Monsanto will focus on producing a limited amount of glyphosate, with selling prices slightly above the generic products. In 2012, the Brazilian glyphosate started to be quoted at USD8.00/kg, receiving a 66% decrease in price from Jan. 2012 to Dec. 2012, according to data from ANDEF - Brazilian Association of Generic Pesticides.

With the 12% tax on imports of glyphosate, the raw material of glyphosate that arrives in Brazil begins to face difficulty to compete with the domestic market. Moreover, the rising production costs of glyphosate in China, combined with the current exchange rate, are favoring Brazilian agrochemical industry. The specific anti-dumping tariff with the maximum of USD2.52/kg which negatively affects Chinese glyphosate industry is effective until Feb. 3, 2014, being applied to products with No. 2931.00.32, 2931.00.39 and 3808.93.24, according to the Ministry of Development, Industry and Foreign Trade.

Chile will develop mycoinsecticide for citrus fruit industry

In the first week of Jan. 2013, a project to develop a mycoinsecticide was announced in Chile to protect citrus fruit production in the country. The forecast is that the product will reach the market from the first quarter of 2015 and fight *Saissetia oleae*, known as beetle black olive.

The project of this pesticide, which is based on entomopathogenic fungi, is a partnership held between Chilean and Brazilian institutions. The FIA - Chile Foundation for Agrarian Innovation will be working in conjunction with the University of La Serena, University of São Paulo, the company Full House Money for Science SA and the University of Valparaíso. The total cost of product development will be USD186.2 million and the FIA will be responsible for investment USD148.9 million. Undoubtedly, it's a project that reflects the preoccupation of the Chilean government to invest in non-invasive means to protect the country's agriculture.

The researchers will sift through 19,020 ha. of citrus trees that produce about 300,000 tonnes of fruit per year, and then they will isolate the materials found in infected areas to assess the potential effectiveness of mycoinsecticide.

According to the Chilean newspaper - The Santiago Times,

Carmen Jorquera, a researcher at the University La Serena, says that this kind of initiative is starting in Chile and there is the need to have consumer goods that have little or no environmental impact in the market, following the requirements of the international market. The US absorbs 74% of Chilean exports. In 2012, the total Chilean export of citrus fruits was 166,660 tonnes, increased by 4% compared to 2011.

Further according to The Santiago Times, the disadvantage is that the proposed product takes longer to take effect than the traditional insecticides. Furthermore, the mycoinsecticide cannot be used on different types of pest. However, according to information, the new method will not kill mammals or pollute the environment, and, especially, the insects cannot become resistant to it.

Nowadays, the Black Olive Scale Beetle is countered by the use of agrochemicals, and there is no offer of a natural input for this purpose in Chile, which causes the mycoinsecticide to arrive as an innovative product.

The mycoinsecticide works through infection, in which the insect feeds and comes into contact with the fungus that is designate to kill him. The beetle secretes a sticky substance



that gives conditions for a dark mold covering the plant and this situation complicates the process of photosynthesis and flying leads get sick.

According to Juan Carlos Galaz, project supervisor at the FIA, in an email to The Santiago Times, the efforts of the project aim at isolating microorganisms so as to be able to kill the pest and reduce the use of chemical insecticides. There is a clear concern in reducing the use of agrochemicals in Chile. The country aims to become a reference in the clean fruit industry, being seen as a market that has agriculture free of

pest. The geographic isolation and climatic conditions of the country help farmers to keep the pests away by natural way.

The planted area with citrus fruits in Chile currently totals approximately 15 thousand ha., being distributed especially among the regions of Atacama and O'Higgins. The annual growth rate of areas of lemon, orange and tangerines is expected to be 1.2%, 2.2% and 4.0%, reaching 8,500 ha., 10,100 ha., and 2,800 ha. in 2014, respectively, according to the Ministry of agriculture of Chile.

Increase of weeds herbicide resistance in Argentina

The forecast of growth of weeds resistant and tolerant to herbicides generates preoccupation of producers in Argentina. These weeds are gaining more presence and the forecast for 2015 is that there will have between 6 and 7 million ha. with presence of *Johnsongrass* and 12 million ha. of *Conyza bonariensis*, although they are not the only problems with weed plants in Argentina.

According to Luis Eduardo Lanfraconi, technical extensionist of INTA - National Institute of Agricultural Technology - in Río Primero and professor at the department of plant protection at the Catholic University of Córdoba, Argentina is under a critical situation. In the current systems of production of the country, weeds resistant to herbicides are a problem that causes an increase in production costs and loss of earnings.

Due to heavy rains that hit Argentina in 2012 there was delay in herbicide applications and thus, many soybeans were planted in lots of *Conyza bonariensis*, aggravating the situation, since it's not possible to control planting affected, as the manager of the program REM - Knowledge Network in Plants Resistant Weed - Martin Marzetti, says.

The *Sorghum halepense*, which is resistant to glyphosate, advances from Salta, in northwestern Argentina, to the south of the country and is now also in Buenos Aires. In addition, *Ryegrass*, which is also resistant to glyphosate, moves from

south to north and has already presented in the north of Buenos Aires, Entre Ríos and south of Santa Fé. *Gomphrena* and *Borreria* are in Santiago del Estero, Santa Fe and Chaco.

According to the director of Man Agro SA, Diego Sanchez Bulk, *Borreria verticillata* is a weed that brings greater preoccupation to the country, since there was no efficient method of control in its combat. Between 20% and 25% of the total area of northeastern Argentina has the presence of *Borreria verticillata*. Moreover, *Gomphrena pulchella* and *Amaranthus plameri* in southwest of Cordoba also deserve attention of producers and those interested in business opportunities in the agrochemical sector in Argentina.

There is an extensive list of weeds which require high doses of glyphosate and only 2,4-D ester has been showing good results in control, as Diego Sanchez says. The herbicide 2,4-D ester has been essential in controlling *Conyza bonariensis* in soybean crop, especially in late Argentine winter.

However, problems with the herbicides also extend to Cordoba. According to Martín Marzetti, southern Córdoba has presented control problems with weed plants resistant to glyphosate and ALS herbicides (imidazolinone, sulfonyleureas).



AAPRESID - Argentine Association of Crop Producers Direct - requires that producers have attention to the explosive growth of weed plants in Argentina. Every year it is recorded in the country the emergence of a new weed, which aggravates the situation. The association also said earlier this month that the weed *Eleusine Indica*, which was under suspicion, is resistant to normal doses of glyphosate. This weed is known in Argentina as "Pata de Ganso" and affects crops of soybeans, corn and sunflower.

According to the study of Greenpace "Tolerancia a herbicidas y cultivos transgénicos (2011)" (Tolerance to herbicides and genetically modified crops), the lack of attention to the first signs of weed plants resistant to herbicides may have been important in deepening the problem of resistance in Argentina. And, according to the publication, glyphosate resistance in most species seems highly probable in the near future.

Good time for Argentine fertilizers market

Based on information from Casafe – Chamber of Agricultural Health and Fertilizers, Argentina may consume 4.5 million tonnes to 4.6 million tonnes of fertilizer by 2015. This estimate was made taking into account the consumption of fertilizer in the country from 1990 to 2007, which was 300 thousand tonnes and 3.715 million tonnes respectively, representing an increase of 1,138%. It is also based on the need to replace nutrients extracted by crops and the needs of building nutrient levels in soils and/or from projections of future sowing area and estimates of fertilizer use per hectare under cultivation in the country.

Argentina is expected to produce around 122 million tonnes of grains in 2015. The projected consumption is based on the replacement of 2.6 million tonnes of nutrients in the five major

grain crops such as soy, wheat, corn, sunflower and sorghum. Importantly, these crops consume 80% of the fertilizers used in Argentina and, according to the Fundación Producir Conservando, the agricultural area of Argentina is estimated at 36 million to 37 million ha. in 2015, considering the area of major crops.

This amount of 2.6 million tonnes represents fertilizer consumption in an average of 4.4 million tonnes. However, with the projection of a similar increase in the consumption of the product in other crops, it is possible to achieve a consumption of about 5.53 million tonnes of fertilizers in 2015, as stated in the Casafe. For comparative purposes, the forecast is that the global demand for fertilizers is 188.3 million tonnes in 2014/15.

Projection of production of grain crops, percentage of replacement and consumption of nutrients for 2015

Crop	Planting area	Production	Replacement percentage				Consumption			
			N	P	K	S	N	P	K	S
	Ha.	Tonne	%				Tonne			
Wheat	6,300,000	17,760,432	80	100	2	52	258,300	63,000	1,260	12,600
Corn	6,100,000	37,687,603	82	98	3	71	414,800	97,600	4,880	30,500
Sorghum	700,000	3,487,959	85	91	4	62	51,800	10,500	420	4,200
Soybean	19,100,000	55,092,779	-	96	4	71	-	286,500	32,470	114,600
Sunflower	2,300,000	4,348,039	81	96	2	60	75,900	25,300	460	4,600
Total	34,500,000	118,376,812					800,800	482,900	39,490	166,500

Source: Casafe



The growth rate of the consumption of nutrient from 2007 to 2015 is projected to be 13%, 85%, 76% and 86% for N, P, K and S, respectively. The lower growth rate of N compared with other fertilizers is due the higher proportion of the projected area planted with soy compared to the other four crops.

The consumption of imported fertilizers in the country represents 71.27% of the total fertilizer consumption from 1990 to 2011. The comparison of the consumption of imported and domestic fertilizers in Argentina is shown below.

From 1990 to 2011, domestic fertilizer consumption grew by 1,409% in Argentina. By contrast, consumption of imported fertilizers showed a growth of 1,106% during the same period, despite that imported fertilizers already represent a greater presence in the Argentine market. Therefore, it is worth the monitoring of public policies in the country for imports of fertilizers and regulations on using these products in Argentine territory, since the imported products have the tendency to make greater participation in the country.

Regarding the previous harvests, it is observed that corn was the crop with the highest fertilizer use in the 2011/2012 season, with its fertilizer use area/total planting area at 88%.

Wheat, sorghum, soybeans and sunflower used 83%, 73%, 62% and 77%, respectively, in their production. However, the cultivation of soybeans had higher production. The soybean acreage was 18,362,499 ha., while corn acreage was 4,777,721 ha.

This same scenario was observed in the 2010/2011 harvest when the soybeans had the highest production and corn had the greater use of fertilizers. 18,478,105 ha. of area was planted with soybean, while corn showed an area of 4,161,688 ha., according to the Argentine Fertilizer Association. The fertilizers were used in 89% of wheat production, 62% in soy production, 90% in corn production, 82% in sunflower production and 67% in the production of sorghum.

The province of Entre Ríos was the largest applicator of fertilizer in soybean production in 2011/2012 season with 99%. This percentage represents 319,768 ha. of fertilizer application in 322,950 ha. of planting area. Then came Santa Fé with 88%, representing 1,237,482 ha. of fertilizer application in 1,406,700 ha. of planting area, and Buenos Aires with 79%, representing 4,611,664 ha. of fertilizer application in 5,829,811 ha. of planting area. These are the provinces with the largest representation.



Source: Elaborated from Fertilizar Asociación Civil's data



■ Policy

Project of law establishes distance for pesticide application in Argentina

In Dec. 2012, a project of law about the minimum application of pesticides was presented to the Chamber of Deputies of Argentina, which will give an order to the common use of these products due to the disparity of understanding between different Argentine provinces and municipalities, such as Córdoba.

The idea of the project is to create a common standard for the whole country with the creation of a body to register the applicators of pesticides. It sets the minimum distance for application of pesticides throughout the Argentine territory, aimed at promoting agricultural production and ensuring the protection of human health and natural resources.

The proposal of Federal Deputy Juan Casañas, proprietor of the Commission of Conservation of Natural Resources and Human Environment, is the prohibition of the use of these products in urban areas, with the exception of spraying

performed with sanitary purposes and with express permission from the Ministry of Agriculture, Livestock and Fisheries. The application areas and land should be between 100m and 1,500m from the boundary of the urban areas. Furthermore, the proposal prohibits the laundering of pesticide application equipment also in these areas, making it clear the concern to avoid contact between the population and agricultural practice.

In Córdoba, the aerial application of chemicals or biological agricultural use within a radius between 500m and 1,500m is prohibited, and the limits of urban and land application within a 500m radius can be observed on *Cordoba Municipal Law No. 9164 (Chemicals Use of Biological and Agricultural)* in its Article 58.

Suggested distances based on acute oral toxicity and dermal acute toxicity		
Suggested distances from the boundary of the application to limit of peri-urban area.	Products to use in ground application according to toxicological class.	Products to use in air application according to toxicological class.
To 100m	Not suggested	Not suggested
From 100m to 200m	Products Class IV	Not suggested
From 200m to 400m	Products Class III and IV	Products Class IV
From 400m to 1000m	Products Class II, III and IV	Products Class III and IV
From 1000m to 1500m	No limitation	Products Class II, III and IV
Over than 1500m	No limitation	No limitation

Source: Agroverdad

For comparison, Brazil establishes a distance of 500m from the population, cities, villages, and sources of water supply for the population, and 250m from water sources and isolated herds of animals. In Uruguay, the constraints for airborne applications are 500m and 300m for land applications of any urban, suburban or town center.

The project of law also provides the creation of the National Register of individuals or entities, public or private, which make use of the pesticide application, allowing the applicator to register and obtain a license for agrochemical use in Argentine territory, the creation of a manual good management practices and the requirement for a prescription for the application of pesticides, issued by an agricultural



engineer with certification for the application. This prescription must include the conditions of application, data from professional issuing the prescription and the company responsible for the use.

The Ministry of Agriculture, Livestock and Fisheries will formalize agreements with the provinces and their municipalities and the City of Buenos Aires in order to make the register able to obtain them throughout the national territory. Furthermore, the organ will make a campaign about good practice in the application of pesticides aimed at public

awareness on the proper use of these products. This campaign, in addition to raising awareness, aims to inform people about the effects of non-compliance with legal requirements and also the possibility of complaints to the agents of surveillance.

For those who do not comply with the requirements of the project, if approved, the consequence goes from a fine of up to partial or total, temporary or permanent cancelation of license application of pesticides. With the approval, the project requirements will take effect within 90 days.

Project restricts use of some Brazil agrochemicals

The Chamber of Deputies of Brazil is evaluating the *Project of Law No. 4.412/12* that restricts the use and supply of technical and formulated products containing the following active ingredients: trichlorfon, thiram, pentachlorophenol, methyl parathion, paraquat, monocrotophos, methamidophos, lindno, lactofem, heptachlor, phosmet, phorate, endosulfan, cyhexatin, carbofuran, benomyl, acephate, abamectin and any substance present in the group of organochlorines, many of which fall into the category of Persistent Organic Pollutants.

Technical products and agrochemicals that have formulated glyphosate as the active ingredient must go through reassessment within 180 days after the publication of the new law. According to the project, these products will be classified as extremely toxic and highly hazardous and also will have restrictions of use until analysis of possible damage caused by their use. If the reassessment has not yet been completed at the end of deadline, records were also suspended and sale prohibited.

Based on the execution of the *Decree No. 4.074/2002*, ANVISA - National Agency for Sanitary Vigilance already banned the active ingredients benomyl, heptachloro, monocrotophos, lindane, pentachlorophenol and trichlorfon. Severe measures were also taken to restrict the use of captan, folpet, carbendazim, chlorpyrifos, metaldehyde,

aldicarb and phosmet.

The main purpose of *the Project of Law* is to fill gaps of *Law No 7.802/89 - The Pesticide Law*, in which, according to the text, there are loopholes that allow products to be registered with acute toxicity, carcinogenicity, mutagenicity and neurotoxicity in contact with public health and the environment. The text also states that the process of reassessment of ANVISA has been inefficient, since the companies that hold registration to trade agrochemical in Brazil make use of various dilatory maneuvers.

In 2010, the ban of endosulfan was already announced to the market from July 31, 2013, after meeting that happened on July 14, 2010 between IBAMA - Brazilian Institute of Environment, Ministry of Health and ANVISA - National Agency for Sanitary Vigilance. Meanwhile, the imports of the product would be prohibited from July 31, 2011. This deadline for withdrawal of the product from the Brazilian market was appropriate to avoid injury to domestic production. The states of São Paulo, Paraná and Mato Grosso are the most dependents on the product.

Besides endosulfan, ANVISA already banned some of these other mentioned agrochemicals. However, some of them are still being sold, even with restrictions on use, and others are under evaluation. According to Deputy Paulo Teixeira, there



is evidence that the products that are being examined are highly harmful to human health.

The project is also rigorous to those who have stocks of all products mentioned. Who has stock of the listed products on the date of publication of the new law should return them to manufacturers or importers that should proceed with the disposal properly. If the manufacturers or importers no longer exist, the national registration of pesticides shall indicate the destination for each product. Moreover, with project approval, the records that may exist for those products will be automatically canceled.

From an economic standpoint, the marketing restrictions of glyphosate in Brazil will bring several consequences. The country consumes about 280 million liters a year of the active ingredient and it's estimated a market close to USD1.5 billion, with approximately 51 glyphosate products registered in the country. Monsanto has 70% share of this market.

To transform the project into law remains only to vote in the Committee on Constitution and Justice and Citizenship. The approval is expected.

Brazil may start using tracking in agrochemical containers

The traceability of waste and agrochemicals container may be soon a reality in Brazil. On Dec. 18, 2012, *the Project of the House No. 55/07* was presented to the Senate. This project focuses on the disposal of waste and packaging of pesticides used in food production.

As the growing demand for traceability and agrochemical containers in the European Union, traceability in Brazil will bring the modernization of food production in the country, putting closer the relationship between productivity and preserving the environment, preventing the emergence of toxic waste in the future, which certainly affects the quality of the food. With the success of the tracking system in Brazil, the products to be exported will have more reliability and competitiveness. The country is the world leader in collecting packaging. As stated by Senator Maggi, the State of Mato Grosso, in the Midwest region of Brazil, collects more packages throughout France. Mato Grosso already has 97% of its properties that make use of agrochemical containers now working with the model proposed. São Paulo and Paraná lead the 2nd and 3rd positions, respectively.

Although there are good expectations about the success of the traceability system, it is of great importance to keep in mind the issue of surveillance in Brazil. There are lot of examples of deviations from empty containers, even with



federal supervision, in areas more distant from large urban centers, where there is no incentive and awareness of small buyers of agricultural pesticides. These buyers have much more responsibilities in the recycling of the containers than companies that are required by law to collect the packages assigned.

Between Jan. and Nov. 2012, approximately 37,000 tonnes of agrochemical containers used on farms in Brazil went through treatment and reused. In the same period of 2011, approximately 31,200 tonnes of containers were handled, in accordance with the Agência Brasil's news. The reverse logistics of empty agrochemical is mandatory in Brazil for 10 years, and each agent of the supply chain has a responsibility



to comply with the provisions set out in the National Policy on Solid Waste, but actually agents don't practice as what the provisions say.

Of the total volume of pesticide containers used in Brazil, 80% of the volume is collected and treated properly, as Cesar John Rando, president of Inpev - National Institute for Processing Empty Containers, says. However, it is still necessary to trace the remaining 20%, ensuring the quality of products that arrive in Brazilian families and in the target foreign markets. The reuse of these containers must accompany with growth trend of the agricultural market.

The tracking model is to use the bar code on each package or microchip to be used in cultivation. With this, the government

can monitor from the stage of manufacture of pesticides to the sale and return of container. Importantly, the project of law also modifies the *Law No. 7.802/1989*, which regulates the research, production and marketing of pesticides in Brazil.

This modification updates the fines that those who do not comply will be subject to measures protecting the environment and human health through the use of agrochemicals. Once approved, the project will help to control actions, inspection and monitoring of pesticides, as well as its components. The *Project of the Representatives House No. 55/07* will still have to return to the analysis of three committees, once it proceeds together with the *Project of Law No. 337/08*, which also determines the adoption of mechanisms to track pesticide.

■ Company Dynamics

Yara will get 25% of fertilizer market in Brazil

In Dec. 2012, the Norwegian fertilizer company Yara International announced the acquisition of the fertilizer business of Bunge Brazil at a cost of USD750 million. The purchase includes capital of USD385 million and other assets valued at USD365 million, such as blending plants, brands and stores.

With the acquisition of Brazilian assets of the US company, Yara International's expectation is that its participation pass can increase from 9% to 25% of the fertilizer market in Brazil, as stated by the president of Yara Brazil, Lair Viane Hanzen. The company seeks annual synergies of at least USD25 million by 2014.

The transaction involves 22 blending units of Bunge that had in 2011 a production of 4.8 million tonnes of fertilizers, with revenue of USD2.65 billion and adjusted earnings before interest, taxes, depreciation, and amortization of USD77 million. In addition, two mills, 500 sales representatives with 100 stores at total and approximately 18 thousand customers are also involved. It is expected that the agreement will be

concluded in the second half of 2013, after approval from the Brazilian authorities, such as CADE - Administrative Council for Economic Defense, and the purchase price is subject to certain post-closing adjustments.

According to the CEO of Yara International, Jorgen Ole Haslestad, Brazil is a key growth market, where there is significant potential to increase the cultivation area and yield. Fertilizer demand in Brazil is growing by 3% to 4% per year, i.e. more than 1 million tonnes per year. The country is the fourth fertilizer market in the world, with the greatest growth and the greatest potential for industry sales.

Bunge says Yara International will continue to provide fertilizers to it for a long time. This partnership allows Bunge to continue to provide fertilizers to farmers as part of its grain origination activities, thereby creating a framework for logistics and other activities related to the sale of fertilizers. The contract also meets the needs of Bunge plantations of sugar cane, according to Yara's operations chief in Brazil, Lair Hanzen, and the company will continue to operate its



fertilizer terminal at the Port of Santos, on the coast of São Paulo state.

It is important to emphasize that, as affirms the CEO of Bunge Limited, Alberto Weisser, the transaction will allow the two companies gain, once Bunge can scale up its activities in the area of fertilizers in order to complement its operations in agribusiness, getting greater flexibility. About Yara, the transaction will provide a higher position in a growing market, which confirms its participation in the global scenario. Employees and Brazilian customers also will benefit from the agreement.

Yara International is considered as one of the world's largest suppliers of mineral fertilizers and with the purchase of fertilizer assets of Bunge, it will get opportunities, mainly in production and distribution, as the senior vice president of

Yara, Egil Hogna, says, given the growing demand for fertilizers in Brazil.

The acquisition of Bunge is the third big deal of Yara in Brazil since 2000. The company bought the company Adubos Trevo and Fertibrás. Egil Hogna says there is still the possibility of acquiring more companies, both in mixing and production. Yara's strategy will follow the demand of agribusiness in Latin America.

Fertilizer consumption in Brazil is concentrated in four main crops: soybeans, corn, sugar cane and coffee. In 2011, these crops accounted for approximately 70% of the total fertilizers consumed in the country.

■ Crops

A brief review about South America's GM industry in 2012

In the season 2011/2011, soybeans, corn and cotton occupied 41.2 million ha. in Brazil. Of this total, 77% of the planted area was occupied with transgenic, i.e. approximately 32 million ha. And the forecast is of growth. For the season 2020/2021, transgenic soybeans will occupy 95% intended area for the soybean planting, which represents 10% more compared to the rate seen in 2011/2012 season. For corn, 79% of the intended area, an increase of 22%, and about cotton, 85%, representing an increase of 52%.

Still in a Brazilian perspective, one of the widely publicized events in the Brazilian media was the victory of the farmers of the State of Mato Grosso against Monsanto in Oct. 2012. The farmers of the state will not have to pay royalties to Monsanto for the use of genetically modified soybean and cotton. The ruling prevents the company from charging farmers royalties for the use of Roundup Ready soybeans type and argues that intellectual property has been public domain since Sept. 2010.

Another important event occurred in Brazil was the approval of a new transgenic cotton seed from Monsanto by CTNBio - National Technical Commission on Biosafety. The new transgenic seed, known as Bollgard II Roundup Ready Flex, is tolerant to glyphosate and resistant to pests such as *Alabama argillacea*, *Heliothis virescens* and *Helicoverpa zea*.

Outside the Brazilian situation, it is important to highlight the authorization of new genetically modified soy production in Argentina in Aug. 2012. The new GM soybean is developed by Monsanto and has higher production yield, and requires less water and pesticides for its cultivation. The new soybean yields increase by over 8%, which means additional 4 million tonnes of soybeans produced in Argentina.



Already in a Paraguayan perspective, GM corns are some of the developments that are expected to happen in Paraguay. The forecast is that the country will cultivate 3.5 million ha. with GM grain in 2013. In Oct. 2012, the government authorized the use of four commercial transgenic corn. These are varieties of maize corns VT Triple Pro and Mon810 owned by Monsanto, Syngenta's BT11 corn and Dow AgroSciences' TC1507.

In the same period, the Ministry of Agriculture and Livestock of Paraguay has reached an agreement with the Paraguayan Institute of Agricultural Technology for the production of transgenic cotton seeds through an agreement with Monsanto, leaving the production to all producers in the country. The approval for GM corn and cotton makes Paraguay the sixth largest producer of GM crops in the world. The country has 2.8 million ha. planted with genetically modified material, and for the GM crop planting area in 2013 is expected to reach 4.5 million ha..

In Colombia, the acreage of genetically modified soybeans increased from 31,561 ha. in 2011 to 49,710 ha. in the first half of 2012. The regions that more GM corn were planted are Cordoba, with 15,606 ha., Tolima, with 11,996 ha., Meta, with 8,747 ha., and Valle, with 6,746 ha..

In Bolivia, the government announced the modification of *Ley de la Madre Tierra (Law of Mother Earth)*, allowing the rational use of transgenic seeds with the aim of expanding the agricultural frontier and achieving food security for the country. About 90% of the Bolivian soy is GMO and banning GMO products in Bolivia, according to President Evo Morales argues, would affect domestic producers and would seriously jeopardize the goal of achieving food security in the Bolivian territory.

The Ley de la Madre Tierra establishes land rights, rational use and preservation and conservation of natural resources in the context of a vision of development under the principle of respect for the earth.

South America should advance the use of transgenic crops following principles of selectivity and ensuring strict controls that give security to consumers about their use. Brazil, Argentina, Uruguay and Venezuela expanded their agricultural production in the last decade through the use of genetically modified seeds.

Wine production in Argentina wins organic pesticide

In Dec. 2012, Argentine scientists of the Research Group of Environmental Sanitation of UTC - National Technological University, with support from the National University of Cuyo, presented a new method of combating the "grapevine moth", based on an insect pathogenic fungus. The presentation was made at IB50K, which is a contest of a Business Plan with technology base organized by IB - Balseiro Institute.

The introduction of product in the market of Mendoza, Argentina, is expected for Feb. 2013, which generates high expectations for local farmers who suffer from the attacks of

moths to their plantations.



Source: Agencia CTys



The Triple B, name given to the pesticide, has been laboratory tested with encouraging results, and developed from the fungus *Beauveria bassiana*, having the main proposal the nonaggression to the environment.

This has the particularity of having its actions specified, i.e. it strikes only the pest and is also degraded naturally after an exposure time, so it does not contaminate the environment. The pesticides that are used, particularly chlorpyrifos, have no specific actions. They can commit any fruit and also cause problems for mammals, as stated Stella Maris da Silva, researcher and manager of the project.

Besides spraying with chemicals, Stella Maris da Silva said that the country has another method of controlling the moth, which is the use of pheromones. However, the cost of this method is approximately USD300 per ha., which, according to her, hinders the use by small farmers. To obtain effective results, it is necessary to spray pheromones on an area of 25 ha. In this understanding, the Triple B is seen as a much more accessible market.

Since accurate data on the level of loss of local producers with the moth in Argentina is not known, data from Europe can be used as a reference. It is assumed that the direct losses reach around 10% of the total grape harvest in Argentina in 2012, according to scientists of the Research

Group of Environmental Sanitation. According to projections from the National Institute of Viticulture of Argentina, 2.8 million tonnes of grapes are expected to be collected in 2013, representing an increase of 26% compared to 2012.

Importantly, the wine industry is one of the largest industries of Mendoza. The Mendoza region is responsible for over 80% of total production of wine in Argentina, i.e. 241 million liters, due to the continental climate which promotes growing of grapes.

This moth is native from Europe, where it is not classified as a pest. They entered the Chile surreptitiously, hidden in agricultural machinery. This allowed its entry in Mendoza, where its presence was detected in 2010. Since then, Argentina has classified the insect as pest which causes major economic losses for the production of wine. The moths do not only eat grapes, especially cabernet and malbec, but also make small holes that favor the entry of various fungi.

The propagation of the pest is made by the movement or transportation of fresh fruit grape without pulverization and also by the movement of agricultural machinery that does not pass through processes of washing and disinfecting outside the controlled area. With this, the grape wastes that fall on the floor, also the drawers, boxes and other items that are used in harvesting wine become possible propagation paths.

Paraguay prohibits imports of Brazilian banana due to fungus

In Nov. 2012, SENAVE - National Service of Quality and Plant Health and Seeds - alerted factories in banana producing areas in Paraguay before the threat of plague Black Sigatoka (*Mycosphaerella fijiensis*) that is widely distributed in 14 Brazilian states.

Black Sigatoka is an important disease of banana. The worm starts attacking the sheet and reaches the banana fruit, reducing the quality and therefore production. The alert responds to serious damage that the pest could cause to the production of bananas and then the national economy, which

is already an export item.

Given this situation, SENAVE suspended all imports of vegetables, rhizomes and fruits of banana from the Brazilian states where the pest Black Sigatoka is present. The Brazilian government has passed Paraguay a list of states free of the plague, but the Paraguayan government has not yet issued any resolution to allow the entry of bananas coming from these places.

According to the General Director of Technical Institution, Fernando Ríos, the measure was proposed by the



Directorate of Plant Protection due to farmers' manifestation that showed the preoccupation about the entering of pests in Paraguay and the prejudice (damage, loss, waste, injury) that these pests could cause in the banana production. He also affirms that SENAVE declared in June 2010 the areas of banana production in the country as "protected areas" in order to safeguard the plant health status of national production.

The banana-producing areas are in constant surveillance, with regular monitoring, surveys and other procedures being conducted that allow a record of information about the plant health status of banana cultivation and identification of possible outbreaks of plague in Paraguay. It's mandatory reporting of suspected symptoms of Black Sigatoka, which does not yet exist in the country.

Since 2011, Brazilian products like watermelon, peppers, cabbage, carrot, potato and tomato have been prohibited from entering Paraguay. However, the concern of Paraguayan products is not only about the pest, there is also the concern to strengthen the domestic market, since Brazil offers the most competitive prices.

Despite the ban on entry of Brazilian bananas in Paraguay, traders of Ciudad del Este, which borders Brazil, are trading the Brazilian product. Most bananas are bought in Ceasa - Central Supply - of Foz do Iguaçu (Brazil) and taken as smuggling owing to the quality and best prices, according to Paraguayan consumers. In Ceasa of Foz do Iguaçu, 80% of

bananas had Paraguay as destination before the ban.

Besides the damage, the Black Sigatoka also increased the production cost of bananas in Brazil due to the increased applications of fungicides. According to a study conducted by researcher José Gonçalves Sydney, the IEA / Apta Institute of Agricultural Economics of Paulista Technology Agency Agribusiness, the increased cost of production is between 15% and 35%.

In 2011, Brazil produced about 7.2 million tonnes of bananas, with a cultivated area of 511 thousand ha. Exports of Brazilian bananas are approximately 1,309,000 tonnes per year, representing 1.8% of national production. And, due to the presence of the pest in the country, MAPA - Ministry of Agriculture, Livestock and Supply defined phytosanitary measures for the trading of bananas, such as certification of banana producing properties, requirement for wood boxes or plastic first use, the seal of the load and the issue of PVT - Vegetable Transit Permit.



Source: G1 Paraná

Positive outlook for rice production in Brazil

According to the analysis of MAPA - Ministry of Agriculture, Livestock and Supply, projections of production and consumption of rice will lead to increased imports of the product. The production of rice is projected to increase by 1.4% per year.

With the increase of rice production in Brazil, caring for the cultivation of rice and quality are equally important. The positive projections of the sector also generate positive effects for the sector of agricultural pesticides. The MAPA's system provides 100 active ingredients of herbicides, fungicides, insecticides, miticides, ant killer, nematocidal, bactericidal, etc. for rice cultivation, with registration at ANVISA - National Agency for Sanitary Vigilance.



Several fungi attack the rice plantations in Brazil. Among them the fungus *Pyricularia grisea* stands out, which causes rice blast and can also compromise up to 100% of production. Besides this, other fungi have also been highlighted such as *Bipolaris oryzae*, *Rhynchosporium oryzae*, *Cercospora oryzae*, *Rhizoctonia oryzae*, *Rhizoctonia solani*, *Tilletia barclayana* and *Ustilaginoidea virens*. The fungi cause the diseases like brown spot, leaf scald, narrow brown leaf spot, sheath spot, seedling blight, kernel smut and false smut, respectively.

The use of pesticides has direct relation with productivity and grain quality. In the Brazilian state Rio Grande do Sul, for example, an increase was observed in the treated area, which increased from 50,000 ha. in 2003 to 830,000 ha. in 2008. This scenario shows the confidence and producers' need to use these products to increase the profitability of rice cultivation in Brazil.

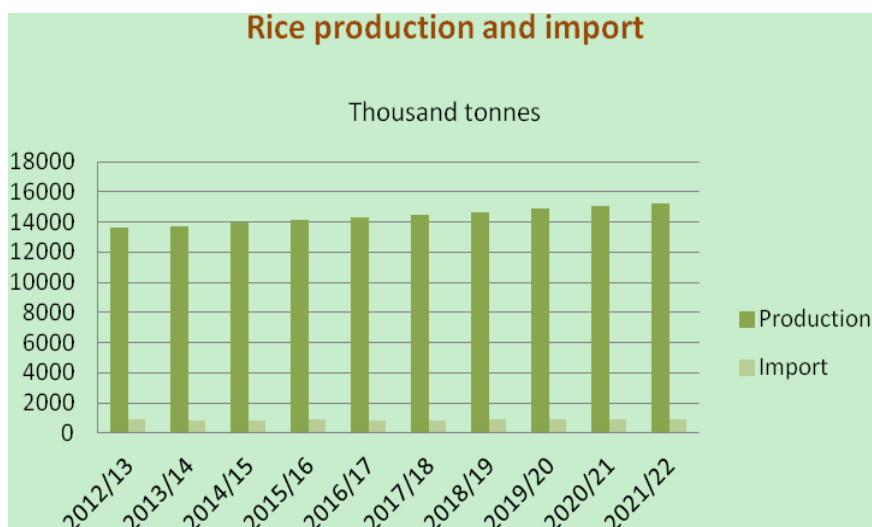
Chemical control in the last 10 years has become a practice more used due to lower cost and higher efficiency compared to other methods of weed control.

The rice planting of the Brazilian harvest officially started in Oct. 2012 in Rio Grande do Sul, the state with more emphasis on the market in rice cultivation.

Brazil has good expectation for a positive scenario, with a reduction of carryover stocks that correspond to leftover grain harvest from one year to the next.

According to Mr. Renato Rocha, president of Federarroz - Federation of Rice Farmers in the state of Rio Grande do Sul, 2012 was a good year for the rice sector and exports are projected to be more than 1.3 million tonnes in 2013/2014. He also affirms that the smaller carryover stocks in nearly 10 years will also create a positive outlook for the second semester of 2013, at which time the market will have a real understanding of inventory. Moreover, the year's recipe will be greater than the production costs.

The projection of production and import of rice for the coming seasons is shown below.



Source: MAPA



The bullish export performance in 2012, even without government support and low demand for rice from neighboring countries, helped establish a recovery scenario of rice prices.

International trade of rice is expected to reach 37.5 million tonnes in 2013, and the increase in Brazilian exports is one of the factors of this evolution, a scenario in which Brazil will regain its global market share. Importantly, global consumption of the product could reach a record 468 million tonnes in 2012/2013, representing an increase of 2%.

In the season 2021/2022, consumption will be met by private and public stocks and imports about 800 thousand annually. In addition, the planted area will reduce from 2.8 million ha. in 2011/2012 to 1.9 million ha. in 2021/2022. However, the state of Rio Grande do Sul will maintain the crop growth, with the acreage increasing by 17.2% and production rising by 27.0%, pushing the Brazilian rice market up and giving condition to compete globally. Besides, the north of Rio Grande do Sul is one of the biggest consumption of agrochemical in Brazil.

■ Brief News

Herbicides have become more expensive during 2011/2012 harvest in Argentina

Some of the main inputs of Argentine agriculture, the herbicides 2,4-D and glyphosate, have registered increase in prices in 2011/2012 season. The increase was 10% to 31% compared to 2010/2011 season. This comparison is made between Oct. 2011 and Oct. 2012.

The price of glyphosate, an important product in weed control, increased by 31%, rising from USD2.9/liter in Oct. 2011 to USD3.8/liter in Oct. 2012. The price of herbicide 2,4-D was registered an increase of 10% over the same period. Initially the product cost USD7.2/liter in the Argentine market, but at the end of the 2011/2012 season, the herbicide cost USD7.9/liter.

According to information from Argentine newspapers Hoy Diario and La Nación, the causes of this increase are disparity adjustment of the exchange rate against inflation and the increasingly high cost of freight.

However, farmers who use fertilizer had good news. Decreases were observed between 3% and 9% in the prices of these products. Urea, for example, decreased by 3%, from USD670/t to USD650/t, diammonium phosphate decreased by 9%, from USD810/t to USD740/t, and triple superphosphate decreased by 3% from USD700/t to USD680/t.

Quitoquímica developing chitosan based fungicide

The FIA - Foundation for Agrarian Innovation – and the company Quitoquímica are developing a fungicide and bactericide based on chitosan to combat contamination of fungi and bacteria in the barrels of exports from Chile. Between 7% and 9% of loss of barrels in cooling chambers are caused by contamination that fungi and bacteria cause during picking of fruits.



According to the foundation, chitosan has an antimicrobial character, having its effectiveness increased due to the addition of organic acids such as acetic, lactic, citric and sorbic acid, which have antimicrobial action. The expectation is that this polymer helps to prevent loss of barrels of fresh fruit export by fungal attacks. The project is expected to be completed in 2014.

The advantage of using chitosan as antimicrobial, according to Galo Cardenas, project coordinator of product development, is that it's combined with metal ions and other additives, which improves its efficiency. Other detail reported is that there are no other products fulfilling the dual function of a fungicide and bactericide biodegradable and biocompatible in the market.

Alfonso Yévenes, supervisor of innovation of FIA, states that the greatest comparative advantage of this new technology and its products is that there will be competition with existing pesticides, which are considered as contaminants and toxic to the environment.

Fertilizer market of São Paulo shows lower price in Jan. 2013

Fertilizers in Brazil became cheaper in the beginning of 2013. Compared to Dec. 2012, the potassium, nitrogen and phosphate fertilizers showed decreases of 4.2%, 2.3% and 1.8%, respectively. However, fertilizer prices are expected to return to levels of Dec. 2012 in Feb. 2013.

According to data from the consulting company Scot Consultoria, a tonne of granulated superphosphate is listed on average at USD391.67 (Exchange rate of Jan. 18, 2013, according to Brazilian Central Bank) in São Paulo, excluding freight.

The cause of this decrease is due to slower pace of business during this period of year and also the fact that companies need to liquidate the carryover stocks, which corresponds to harvest leftover grain from one year to another.

Average price of fertilizers in São Paulo			
Products	USD/t		Reduction
	Dec. 2012	Jan. 2013	
Ammonium sulfate	425.73	414.2	2.78%
Urea agricultural	596.52	587.2	1.59%
Potassium chloride	658.1	630.79	4.33%
Granulated superphosphate	398.33	391.67	1.7%
MAP	739.93	723.25	2.31%

* Exchange rate of Jan. 18, 2013, according to Brazilian Central Bank

Source: Adapted from Scot Consultoria

From Sept. 2012 to Jan. 2013, the potassium chloride also got cheaper, registering a decrease of 12% in the period. A tonne of potassium chloride is listed in São Paulo on average at USD630.79 (Exchange rate of Jan. 18, 2013, according to Brazilian Central Bank).

From Jan. to Nov. 2012, 27.70 million tonnes of fertilizers were sold in Brazil, according to ANDA - National Association for the



Promotion of Fertilizers - registering an increase of 4.5% over the same period of 2011. According to the Ministry of Agriculture, Brazil is heavily dependent on imports of fertilizers, especially potash, whose imports represent 90% of domestic consumption.

Forecast for Brazilian GM industry

According to Brazilian newspaper Estadão, the area planted with GM crops in Brazil, including soybeans, corn and cotton, is expected to reach 37.1 million ha. in the 2012/2013 harvest.

Soybean is the crop with the largest area planted with transgenic seeds, with a total of 24.4 million ha. Compared with the 2011/2012 season, there was an increase of 3 million ha. in area sown with soybeans by genetically modified seeds in Brazil. According to consultancy Céleres, the country will become the largest producer of oilseeds in the season 2012/2013.

Furthermore, it is expected that the total area with transgenic maize must reach 12.2 million ha., representing 76.1% of the total area with the first and second cereal crops, summer harvest and winter harvest, respectively. In the summer harvest of corn, it is estimated a crop of 5.3 million ha., 305,000 ha. more than that in 2011/2012.

The summer planting corn may fall by 905,000 ha. in the 2012/2013 harvest, due to competition with soybeans. The two cultures compete for the area, mostly in the South and Southeast Brazil. About the cultivation of winter maize crop, whose area is expected to be 7.89 million ha., will have 88% with occupancy by sowing GM. Finally, about cotton, the estimated area with transgenic seeds is 550 thousand ha.

This forecast reflects the spread of biotechnology by major producing regions of the country. Mato Grosso leads the list with an area of 9.9 million ha. of transgenic crops, followed by Paraná, with 6.8 million ha., and Rio Grande do Sul, with 5.4 million ha..

New Brazilian rules for aerial spraying of pesticides

On Jan. 4, 2013, the Brazilian government changed the rules for the aerial application of pesticides containing imidacloprid, clothianidin, thiamethoxam and fipronil. The application of these products will only be permitted in cases where the agricultural aviation is essential.

Under the new rules, companies are responsible for communicating with the Ministry of Agriculture monthly about the application of the products. The aerial application to control agricultural pests of that type of agrochemical must follow certain conditions. Farmers must notify beekeepers located in a radius of 6 km within a minimum of 48 hours.

In Oct. 2012, the Ministry of Agriculture and IBAMA - Brazilian Institute of Environment and Renewable Natural Resources, by exceptional and temporary way, allowed the application of those active ingredients in cultures of sugar cane, soybeans, wheat and rice by June 30, 2013. This month (Jan. 4), the cotton crop was also included among the exceptions approved by the government.

The measure was taken because the use of insecticides containing these active ingredients has been linked to death of bees in different regions of Brazil. The reduction in the number of bees worries the Brazilian government and farmers, since they have a



direct effect on food production. Bees are responsible for about 70% of the pollination of plants, as stated in the FAO - Food and Agriculture Organization of the United Nations.

According to information from IBAMA, in 2010, 1934 tonnes of imidacloprid was sold in Brazil, representing 60% of the total quantity of the four substances traded under examination.

Decrease of Colombian coffee production in 2012

In Dec. 2012, the coffee production in Colombia was 904,000 60-kg bags, representing an increase of 23% compared to the same period of 2011. However, the Colombian production totaled 7.74 million 60-kg bags in 2012, down 1% from the total harvested in 2011. The causes for this scenario were the climate unfavorable to crops and plantations renewal program that was slow to generate results.

For 2013, coffee production is expected to exceed 10 million 60-kg bags, returning to previous levels. According to Fedecafe - National Federation of Coffee Growers - the program of renewal of plantations should bring improvements to the quality of harvested coffee. Farmers plan to reduce production costs through the use of technology.

With this positive expectation of increased coffee production in 2013, sales of insecticide and fungicide tends to increase due to the need to combat pests, especially in the Andes, which is a region that offers exceptional weather and rainfall patterns, enabling the country spoon coffee during all months of the year.

Colombia recognized 100 species of insects that live in harmony with the cultivation of coffee, but only three represent economic impact, such as *Hypothenemus hampei*, *Leucoptera coffeellum* and *Dysmicoccus spp.* There is record of *Hypothenemus hampei* in Colombia since Sept. 1988 and since then it have caused great losses to coffee cultivation. It is the most harmful pest to this crop. Besides the insects mentioned, it is important that the rust has become a major issue in recent years for Colombian producers.

So for future, it is interesting to monitor the coffee sector, since there will be opportunities for the investment of agrochemicals that satisfies Colombian demand for methods to reduce losses caused by pests and help increase productivity and quality of crops.

Argentine soybean market facing difficulties

According to the forecasts of the Buenos Aires Cereals Exchange, Argentina could plant 19.7 million ha. in 2011/2012 harvest. However, the planting of this harvest reached 16.7 million ha., which represents a decrease of approximately 15%, and a coverage of 84.9% of the total area is available to crop. The south of Cordoba has a cutting area of 60,000 ha. of soybeans due to excessive rain.

As for the forecast for 2013, soybean production in Argentina is expected to be 3 and 6 million tonnes lower than the latest projections which were 55 and 56 million tonnes, with the rains still affecting the country. The expectation now is that prices



register a good performance due to the significant cut in the South American harvest.

In 2012, Argentina, the South America's largest exporter of soybean oil and meal and third largest soybean producer – losing position only for the US and Brazil –, encountered difficulties in planting soybeans due to several months of large amount of rain that hit the country.

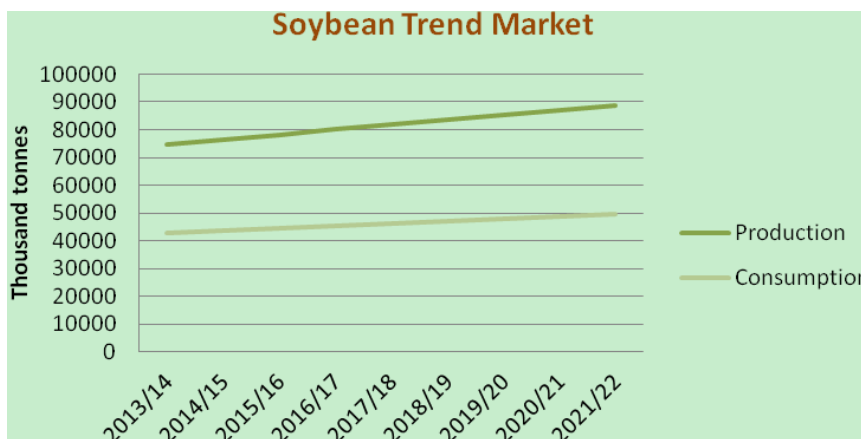
The main progress in planting occurred in areas of core North-South as well as in Sul Bonaerense and the provinces of Salta, Tucumán, Chaco and Santiago. According to the Buenos Aires Cereals Exchange's report, it is now possible to observe plants in full bloom or leaf development and normal health. Thus, the general conditions that currently the crops have are considered good, and the exception stands out in those regions that suffered from high winds or hail.

Besides the rain, the north and south of Córdoba, Entre Rios eastern central La Pampa Northwest, North Central and nuclei of Santa Fe, are being monitored due to the presence of insects (caterpillar bollillera, bug and Anticarsia) in plantations and the first appearances of brown spot and frog-eye leaf spot which is a fungal disease that damages soybean cultivation for attacking leaves, pods and seeds.

Increasing of Brazilian soybean production and consumption

For those who have an interest in the Brazilian soy, MAPA - Ministry of Agriculture, Livestock and Food Supply – makes positive projections for next years. With a growth rate of 2.3% per year, production of soybean crop in 2021/22 is expected to reach 88.918 million tonnes. In the harvest 2011/2012, the production has declined due to drought in some regions of the country.

In the same scenario, consumption of soy in Brazil can reach 49.6 million tonnes in 2021/22, representing 55.8% of production. The annual average growth rate for consumption is 1.9%.



Source: MAPA

The average annual growth rate of global production is 0.84% per year, according to information of MAPA. Therefore, it appears an opportunity for Brazilian exports.



With an expected growth rate of 2.8% per year, Brazilian soybean exports may reach 44.919 million tonnes in 2021/22. In Dec. 2012, Brazil sent 135,000 tonnes of soybeans abroad.

One reason for this positive projection of Brazilian exports of soybeans is that demand from China, according to CONAB - National Supply Company - should increase imports of the product between 7% and 10% in 2013.

According to EMATER - Technical Assistance and Rural Extension Enterprises, South America should harvest 139.5 million tonnes of soybeans, with Argentina producing 53 million tonnes of soybeans in the 2012/2013 harvest. One of the causes of this positive scenario in Brazil and throughout most of South American countries is the relatively low production costs.



The advertisement features a green background with a blurred image of rice plants. In the top right corner, there is a logo consisting of two stylized green 'M' shapes. The main text is in white, bold font, and the subtext is in a smaller white font. At the bottom, there is a photograph of rice stalks and a green button with white text.

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