

Biocontrol in Brazil

Overview of the Crop Protection Market

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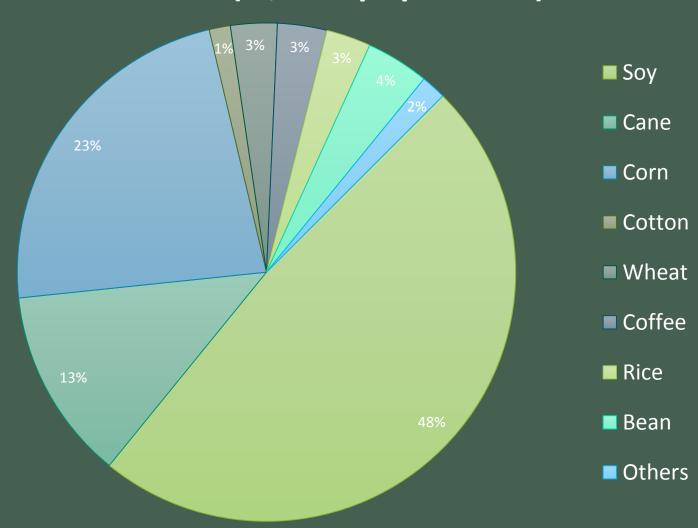
Agribusiness in Brazil

- Total cultivated area / row crops
 - Soybean 33,2 M ha, or 57%
 - Corn 15,9 M ha
 - Beans 2,84 M ha
 - Wheat 2,09 M ha
 - Rice 2,0 M ha
 - Cotton 954 m ha
 - Peanuts 119,6 m ha

- Total cultivated area / perennials and semi-perennials
 - Pastures 168 M ha
 - Sugar cane 9,07 M ha
 - Coffee 1,9 M ha
 - Fruits 2,5 M ha



Planted area (%, except pastures)





Market Share in the World Market, Sept 2014

- Sugar 49% <u>- 1st</u>
- Coffee 29% 1st
- Orange juice 80% 1st
- Soybean 42% 1st
- Corn 17% 2nd
- Cotton 6% 5th

- Cattle meat 20% 1st
- Poultry meat 34% 1st
- Suine meat 9% 4th
- Soybean oil 16% 1st
- Soybean meal 23% 2nd



The Green Revolution and the Chemistry

- Mechanization and economies of scale
- Genetic Improvement
- Soil amendment and plant nutrition
- Chemical control of insects and plant diseases



The Agricultural Model in Brazil - the last 25 years -

- Strong performance of trading companies and prioritization of commodities
- Drop in public funding sources for crop costing
- Growing participation of trading companies in the private financing of the cost of crops
- Growth in the share of private banks in the transfer of funds from the federal government (BNDES) to finance equipment and infrastructure
- Performance of machine manufacturers in own financing for customers



But where the biologicals appear in this agribusiness growth scenario ????



The signs of exhaustion of the current system of agricultural pest control

- High rate of resistance of pest populations to chemical products used in crop protection
- Increase of production costs due to low efficiency in pest control
- Society pressure for food with no chemical contaminants
- Search for a lower environmental impact solution



The challenges to be overcome

- Wrong approach to the legislation by inspectors of regulatory agencies
- Slow registration process
- Dissemination of home made bio-factories that makes products with no quality control and uses as active ingredients formulated products registered legally
- Illegal Businesses and non-registered biological products that exploit the same niche market of legalized companies elude the oversight of inspectors



The challenges to be overcome

- Low number of biological active ingredients registered
- Lack of marketing strategies for wide dissemination of knowledge
- To develop better positioning strategies of formulated products for maximum efficiency of biological active ingredients
- To develop biological active ingredients and formulated products to control foliar diseases



The challenges to be overcome

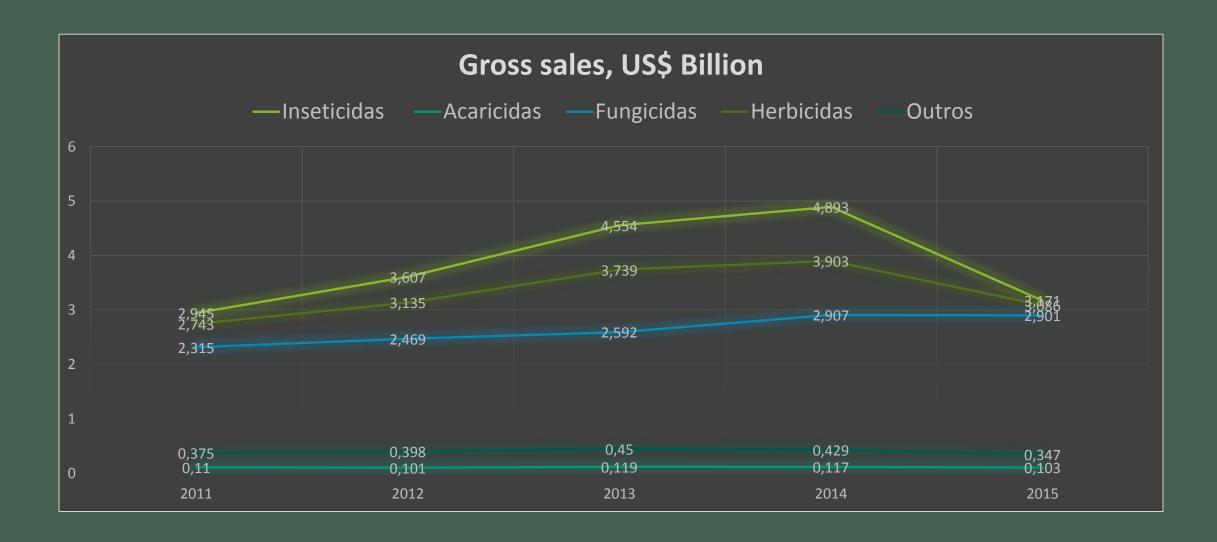
- Lack of official extension service for biological control
- Lack of credit lines for resellers and distributors
 - Barter and rebate policies
- Lack of adequate training of commercial agents
 - Technical Knowledge of IPM
 - Knowledge of the biology of both pests and biological control agents



An Overview of the Crop Protection Market by SINDIVEG

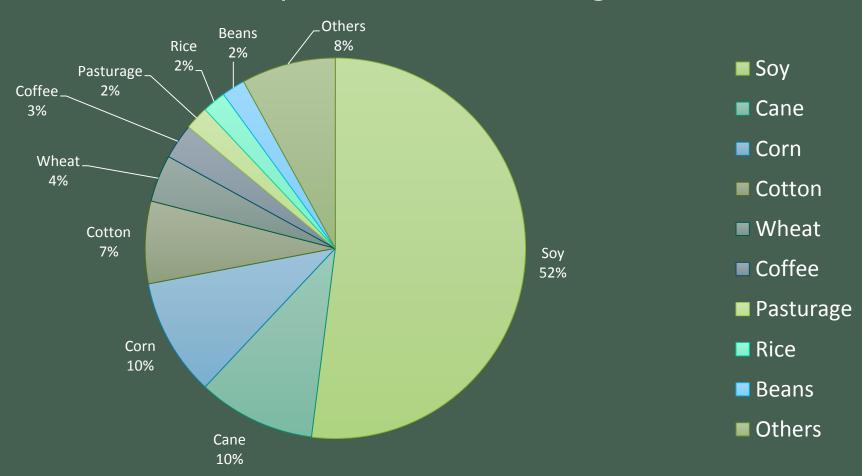
Classes	Gross Sales, US\$ MM					% Variation			
	2011	2012	2013	2014	2015	15/11	15/12	15/13	15/14
Total	8.488	9.710	11.454	12.249	9.608	13,20	-1,05	-16,12	-21,56
Insecticides	2.945	3.607	4.554	4.893	3.171	7,67	-12,09	-30,37	-35,19
Herbicides	2.743	3.135	3.739	3.903	3.086	12,50	-1,56	-17,46	-20,93
Other	375	398	450	429	347	-7,47	-12,81	-22,89	-19,11
Mite control	110	101	119	117	103	-6,36	1,98	-13,45	-11,97
Fungicides	2.315	2.469	2.592	2.907	2.901	25,31	17,50	11,92	-0,21







Market Share per culture in 2015; gross sales





Total sales of biologicals in 2015

- around 2% of total Crop Protection Market
- Decrease in gross sales of biological insecticides (Bt)
- Increase in sales of biological fungicides for the control of soil born diseases
- Increase in sales of Trichogramma sp. in sugar cane and other row crops
- Increased market share of illegal Bt and Trichoderma spp. formulated products



The Opportunities

- The new generation is preparing to take charge of agricultural production in Brazil
- Major technological advances
 - Precision agriculture
 - Image Analysis
 - New generation of fertilizers and
 - New formulas of biopesticides
- The use of internet to access knowledge
- The adoption of the concept of Integrated Pest Management



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