Globalization: Challenges and Opportunities for Biocontrol Solutions

A perspective from Colombia, South America

Nicolás Cock Duque CEO, Co-founder Ecoflora Agro Executive Director Asob<u>iocol</u>







Contents

I. Globalization: challenges for a sustainable and competitive agriculture in LATAM

2. Colombia's potential Contribution to Sustainable Agriculture and to Feed the World Sustainably

3. Colombia: the birth place of several global biocontrol pioneers and innovators...

4. Benefits of Biocontrol in the framework of True and Sustainable IPM

I. Globalization:

ecoflora. Aglo

Challenges for a sustainable and competitive agriculture in LATAM

Where will we find enough food in 2050 for 9 billion?

ecoflora. Aglo

And how will we produce it in a sustainable way...?

ecoflora. Aglo

ARABLE LAND PER CAPITA



Efficient and sustainable systems to feed the world are imperative...

Source: FAO - Food ans agriculture Organization of the United Nations

ecoflora Aglo

I. Globalization: Challenges for a sustainable and competitive agriculture in LATAM





Mexico & Central America

South America

Latin America – share of global trade in food and agriculture Source: UN Comtrade, FAO, Rabobank A key continent for global food security and climatic stability

ecc

¿Potential for Cropland Expansion?



eco



Small and subsistence farming vs agro industrial farming



SZ

ecoosfera.com/wp-content/imagenes/Deforestation-Amazon.jpg





eco

Source: www.eea.europa.eu/data-and-maps/figures/ projected-impact-of-climate-change

Free-trade vs subsidies





ecoflora Agio

Free-trade vs subsidies

eco



Growing gaps and inequalities between rich and poor (amongst and within countries)



Petroeconomy vs Bioeconomy

eco

Source: http://ec.europa.eu/research/bioeconomy/images/bioeconomy_graphic_full.jpg

ecoflora. Aglo

Projected impact of climate change on agricultural yields * A key culprit in climate change - carbon emissions - can also help agriculture by enhancing inthesis in many important (.... photos crops such as wheat, rice, and ovbeans. The science, Change in agricultural productivity nowever, is far from certain on the fits of carbon fertilisation. between 2003 and the 2080s This map represents the case of beneficial carbon fertilisation proces No data +5 -15 -25% +25 +10 0 -5 Source: Cline W., 2007, Global Warming and Agriculture

Source: www.eea.europa.eu/data-and-maps/figures/projected-impact-of-climate-change



ngm.nationalgeographic.com/2011/07/food-ark/food-variety-graphic

Genetic erosion vs. GMOs
Food safety vs. food sovereignty
Biofuels vs. food

eco



Deforestation, agricultural frontier expansion vs. climate change and biodiversity loss and food safety

How China See's the World...





ecotlora Aalo

ecoflora Aglo



A megadiverse country Located in the Heart of the Americas

eco



Colombia is a megadiverse country: No. 1 worldwide on species diversity / Km²

Colombia has access to more than 45 countries and

eco



www.procolombia.co/

LATIN AMERICA'S PACIFIC ALLIANCE

The new Latin American Pacific Alliance regional bloc, signed into being at a summit held at an observatory in Chile on Wednesday, aims to foster commerce, efficiency and integration between its members and Asia



Colombia is part of New Geopolitical and Economic Alliances that are gaining momentum

Source: https://www.weforum.org/agenda/2015/04/the-latinamerican-economy-in-8-charts/

eco

Crop	Cultivated Area (ha.)	World Rank (Exports)
Cut flowers	7,500	1 Production 2 Exports
Banana	50,000	2
Coffee	950,000	3
African palm	500,000	4
Avocado	16,000	5
Sugarcane	232,000	7 (No.1 in productivity: tons sugar/ha.)
Cocoa	180,000	8
All	7,100,000	

New land available for farming: 6,000,000 million has.

Source: Ministry of Agriculture

Main crops in Colombia

"Colombia has enough land to become a global food pantry..."

Challenge and opportunity of reconverting extensive inefficient cattle ranching into sustainable productive activities Current vs. Potential Land Uses (Million has.) in Colombia

eco



Source: Ministry of Agriculture

eco



eco

Organic Agriculture Vs. Total Area Grown (%) in LATAM



Area (has.) grown in Organic Agriunture in LATAM conuntries



6.78 million has of Organic Crops in Latam/ 43.66 million of world's total (15.5%) in 2015

eco

Source: IFOAM and FiBL

ecoflora. Aglo

Organic food shouldn't be an elite's luxurious good

Healthy (innocuous) food should be a human right...

No Latam country s amongst top 12. The World's Largest Markets For Organic Products Organic retail sales value by country in 2013*



More than 180 million has. Of GMO crops grown worldwide in 2015. 76+ million in LATAM (42% of world's total)





ecoflora. Aglo

100,000 ha. of GMO crops grown in Colombia

22 ATLÁNTICO

548 (2) 162 || BOLÍVAR

362 (2) 871 () SUCRE

5.576 (2) 16.084 () CÓRDOBA

9.383 VALLE DEL CAUCA

7.343 (2) 15.504 () TOLIMA

307) CAUCA

V

Agro-Bio

304 J ANTIOQUIA

397) CALDAS

1.574 D RISARALDA

631 QUINDÍO

Fuente: ICA (Instituto Colombiano Agropecuario)



ecoflora Agio



0

Conventional pesticides vs. Biocontrol solutions in Colombia

97 to **98%** of the crop protection products sold in **Colombia** (US 500 million in 2016) are chemical pesticides

10



Many molecules still being sold in Colombia have already been banned in the countries where these were synthesized or in the destination countries of Colombian agroexports. More external pressure than internal conscience for innocuous food. ecoflora Aglo 3. **Colombia:** The birthplace of several global biocontrol pioneers and innovators... ecoflora Aglo









Live Systems Technology, la compañía líder en innovación tecnológica en produtos biológicos para la agricultura. Contamos con más de 25 años de experiencia en los diversos campos de la biología, la ingeniería y la agronomía y en el desarrollo de productos biológicos y su uso en programas de manejo integrado de plagas y enfermedades y de cultivos agricolas (MIP-MIC) y en agricultura orgánica. Cuente con nosotros si su deseo es Consolidar y Potenciar la rentabilidad de sus cultivos.

00





ICA fija fechas de siembra de Algodón 2015 El ICA presentó las fechas que componen el ciclo de siembra para el 2015



Plant extracts for Crop and Life Protection B Corporation

Certified

bcorporation.net



Union for Ethical BioTrade

SOURCING WITH RESPECT®

To promote Ethical BioTrade practices by offering UEBT members independent verification, technical support and networking opportunities for biodiversitybased innovation and sourcing in the framework of the CBD and the Nagoya Protocol.



Purpose

To promote biocontrol as technological solutions that contribute to a systemic change of Colombia's agriculture positively impacting farmers and consumers and the country's competitiveness, sustainability, food security and sovereignty, environmental protection, biodiversity conservation, and public health.

Asobiocol

Colombian Association of Biocontrol Manufacturers



4. **Benefits of Biocontrol** in the framework of True and Sustainable IPM ecoflora. Aglo

OH

0

HO

The Paradigm: Chemical pesticides are the most effective solution for pest control

ecotlora

AGIO





Botanical Pesticides have complex modes and mechanisms of action, which combine a diversity of Lethal

- and Sub-Lethal Effects, such as:
- Anti-feeding
- Anti-egg-laying effect
- Anti-mating (pheromone interference effect)
- Repellent Effect
- Deterrent Effect

These **effects combined**, can be more than enough to ensure a high standard of **Crop Protection**, even if the lethal effect is medium, low, or negligible



Crop Protection Index (CPI)

ecoflora. Aglo





(Beyond Pesticides, February 4, 2016) Washington State University (WSU) researchers published a review study in the journal Nature Plants that deemed organic agriculture as a necessary tool for feeding the global population sustainably. In their review, which analyzed hundreds of studies about organic and conventional agriculture, soil science and agroecology professor John Reganold, Ph.D., and doctoral candidate Jonathan Wachter referred to organic agriculture as an untapped resource for feeding the Earth's population, "especially in the face of climate change and other global challenges." Using over 40 years of science, this study, entitled "Organic Agriculture in the 21st Century," aptly refers to organic agriculture as the solution to the globe's current and future food crises and conventional farming as an undeniable catalyst in the Earth's demise.

Thanks

ecoflora. Agio

Nicolás Cock Duque - CEO

ecoflora. Aglo

nicolas@ecofloragro.com www.ecofloragro.com

m. +57 310 442 0599 p. +57 4 386 1186