

Bionegocios Sustentables

Del Sur al Mundo, *Abril 2018*



BIOCERES

Claudio Dunan, Ph.D



Iceland

Iceland

food you can t

FREE

Bioceres

We are a fully-integrated agricultural technology company utilizing multiple technology approaches to develop and commercialize products that enhance crop productivity and expand feedstock applications

Addressable Markets



Seeds



Crop Protection



Crop Nutrition



Industrial Enzymes



Fermentation solutions

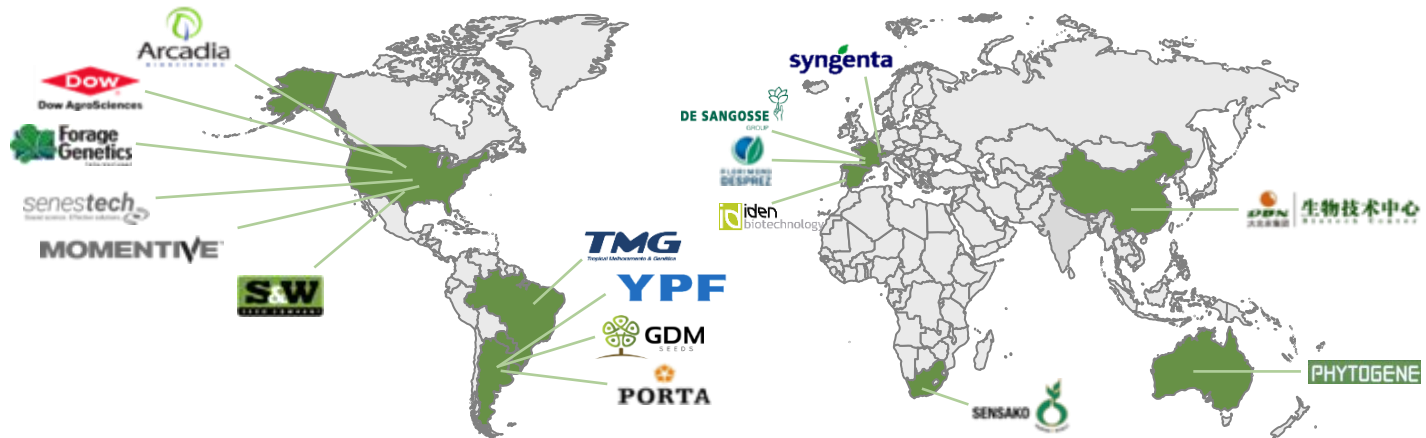
Controlled Pipeline: from IP to Market Access

Technology Sourcing

Product Development Partnering

Production & Market Access

Global Partnership



Bioceres partners with international agricultural companies and leading research firms to develop, deregulate and commercialize technologies for high growth markets



Bioceres

Bioceres' On-Farm technologies seek to improve crop yield and create value for growers



On-Farm Technologies

Bioceres' Off-Farm solutions focus on improving industrial processes to obtain greater value from agricultural feedstock



Off-Farm Solutions



Business Model

1

Technology Sourcing

Multiple Technologies

- Identify **great science** with limited financial exposure
- Develop **multiple technologies** for various applications and global environments
- Finance technology sourcing activities with **public grants** and other capital-efficient sources

2

Product Development Partnering

Multiple Partners

- Develop relationships with the **right partners** to co-fund and reduce financial burden
- Collaborate with **multiple partners** to create new joint ventures and bring products to market
- Share product development expenses with **joint venture partners and strategic collaborators**

3

Production & Market Access

Multiple Pathways to Market

- Leverage shareholder base and proprietary sales channels for **direct access to end-markets**
- Establish **multiple pathways** to markets to maximize market reach and technology adoption
- Bring products to market by utilizing **revenue from operations**





- Creada en 2016
- Base en Argentina
- Producción de quimosina bovina a partir de cultivo de cártamo



- Creada en 2008
- Operaciones en Argentina y Uruguay vía 14 empresas asociadas
- Empresa de mejoramiento y comercialización de semillas



- Creada en 2012
- Base en Argentina
- JV con Arcadia Biosciences
- Desarrollo de traits para rendimiento



- Creada en 2012
- Base en Argentina
- JV con Rizobacter
- Desarrollo de productos microbiológicos de segunda generación

BIOCERES



- Creada en 2013
- Base en Uruguay
- JV con Florimond Desprez
- Variedades de trigo genéticamente modificadas



- Creada en 2005
- Base en Rosario
- Alta tecnología I+D y servicios regulatorios



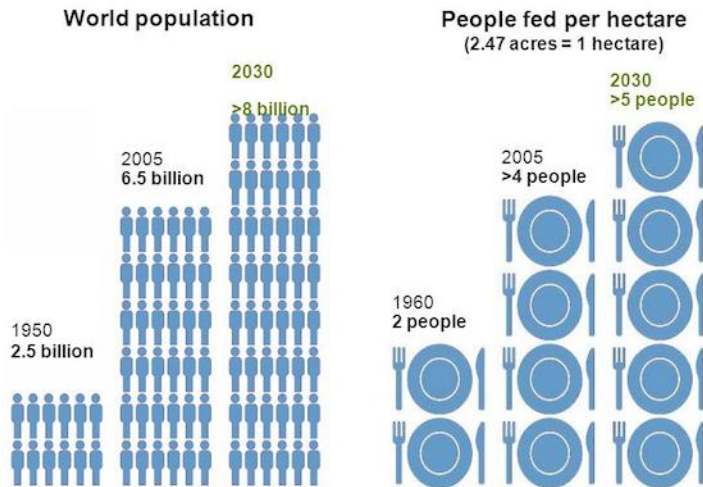
- Creada en 2011
- Base en Rosario
- Soluciones metabólicas para biomateriales



- Creada en 2015
- Base en Rosario
- Alianza entre Cibic e INDEAR
- Servicios en Medicina Traslacional

Mega-tendencias: transición a un nuevo paradigma económico

Demand is driven by population growth and land scarcity

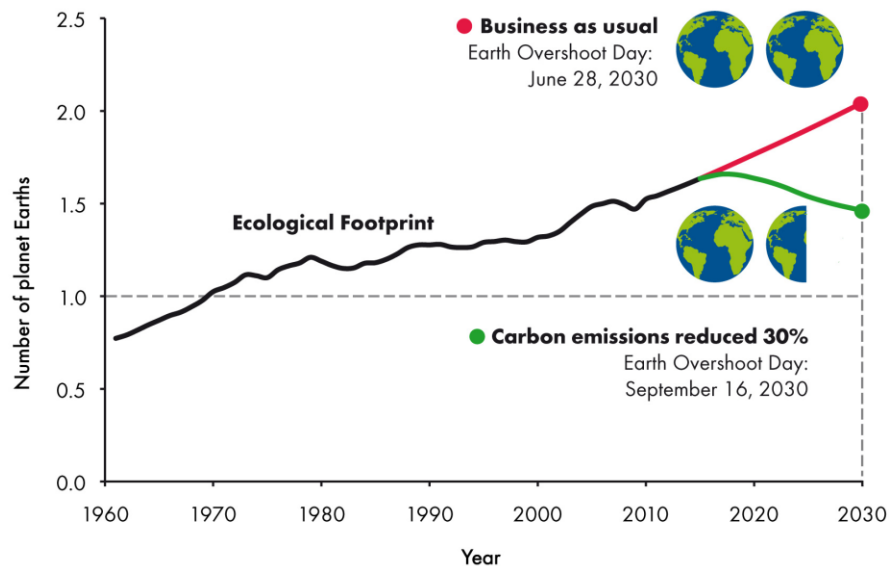


World Population & Arable Land, 1960–2020

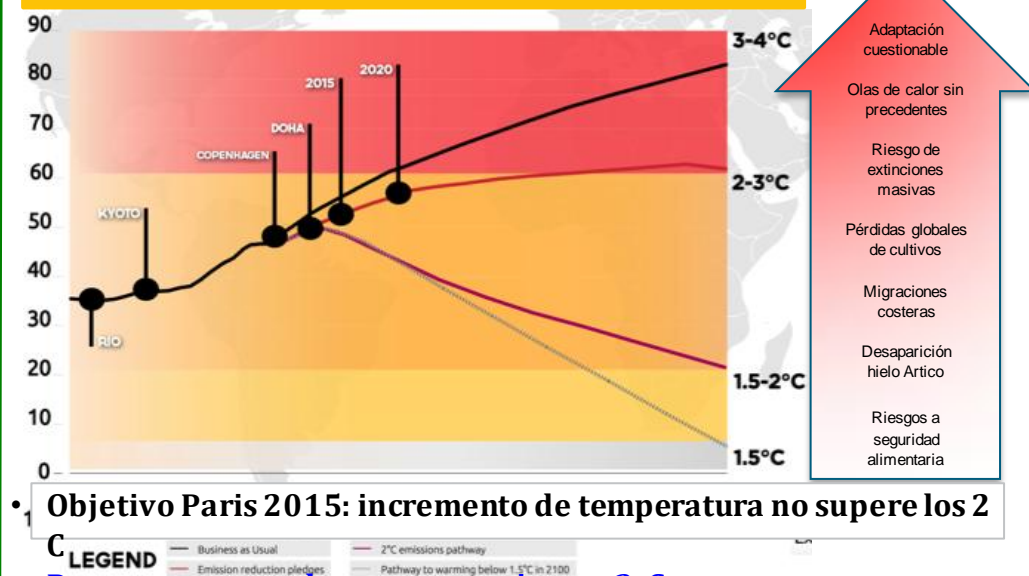


Source: GS&PA Research, FAO

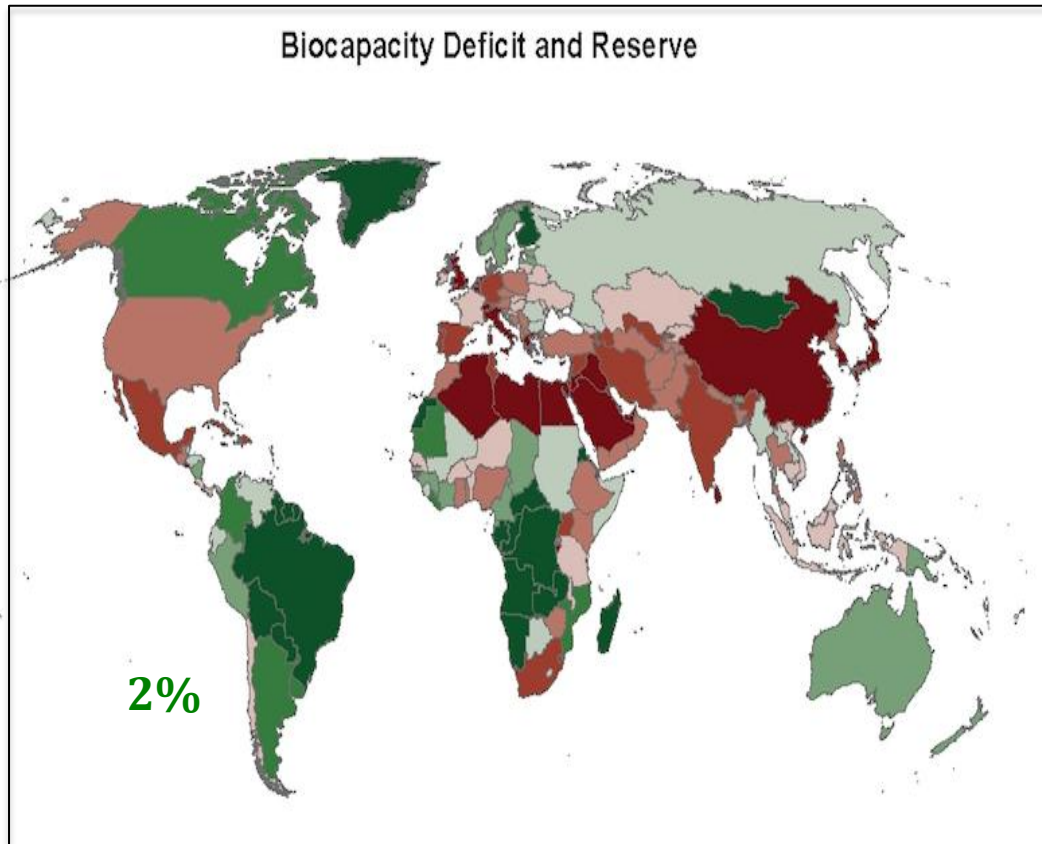
How many Earths does it take to support humanity?



Cambio Climático



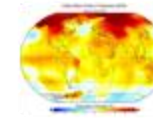
En el Nuevo Paradigma Económico los Bionegocios Representan una Oportunidad de Desarrollo Económico



Porque Bionegocios



Menor dependencia de combustibles fósiles



Mitigación del Cambio Climático



Rentabilidad
Diversificación



Aprovechamiento circular
De recursos



Economía de repetición
Valor agregado local



Basada en innovación



Innovación en Argentina: un largo camino por recorrer

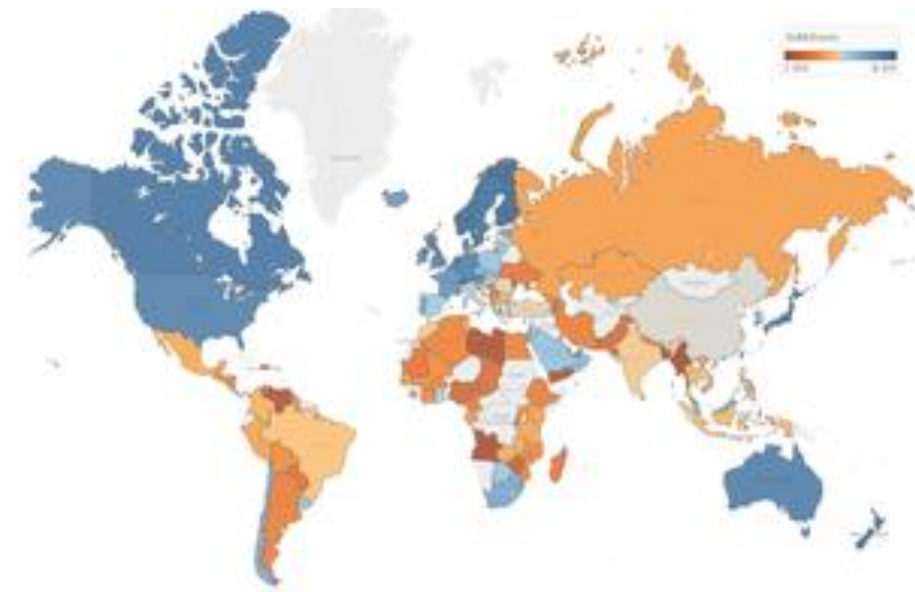
	I + D % PBI
Israel	4,29
Finlandia	3,18
Suiza	2,96
USA	2,75
Australia	2,2
China	2,02
Canada	1,62
Brasil	1,17
LATAM y Caribe	0,69
Argentina	0,59
Africa-SubSahara	0,41

80% Pública

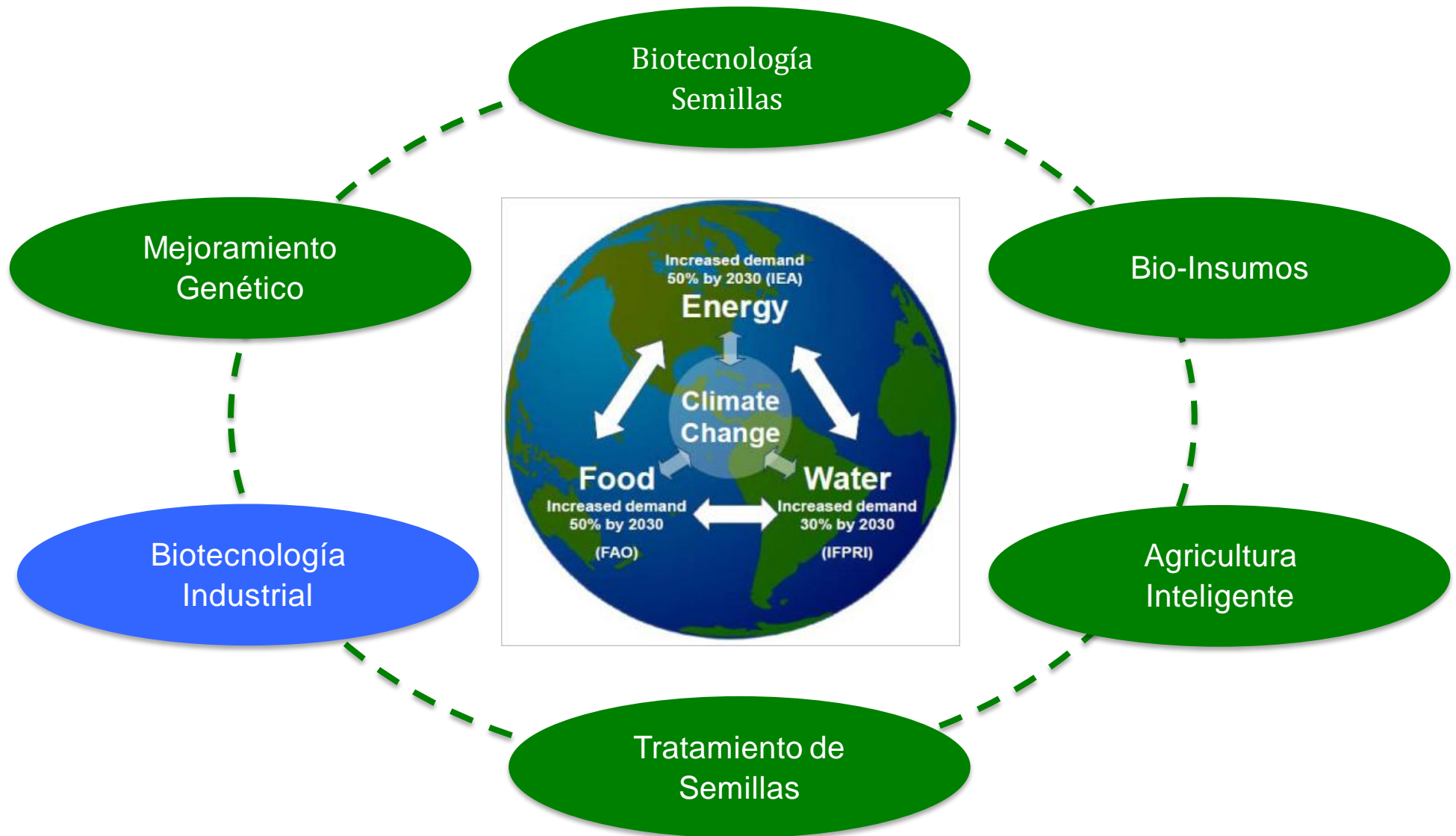


País	Rank
Suiza	1
Suecia	2
Holanda	3
USA	4
R Unido	5
Dinamarca	6
Singapur	7
Finlandia	8
Alemania	9
Irlanda	10
China	22
Chile	46
México	58
Colombia	65
Uruguay	67
Brasil	69
Perú	70
Irán	75
Argentina	76

Propiedad Intelectual



2-3 X tecnologías convencionales



Bioceres: Misión y Foco

Bioceres' On-Farm technologies seek to improve crop yield and create value for growers



On-Farm Technologies

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Off-Farm Solutions

Integrated Product Concept

Ecoseed combines R&D from multiple sectors (including HB4) and partnerships into a single product to improve overall crop yields.

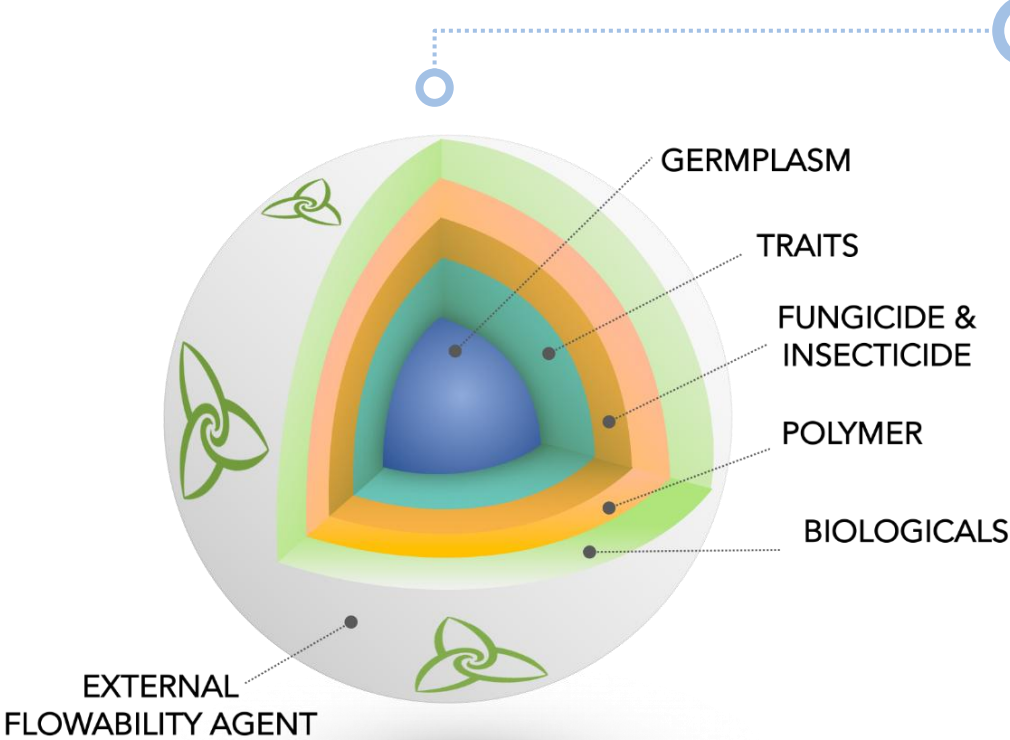
Integrated Product

Combined Seed Technologies


Co-development of germplasm, traits, biologicals and chemical components, sold as a single product.

Meta Seed


Enhancing seed technologies through tailored application and monitoring.




 Monitoring of Crop Evolution

 Hyper localized agro-meteorology and accurate agronomic recommendations

 Satellite monitoring and fleet monitoring

 Geo-referenced scouting

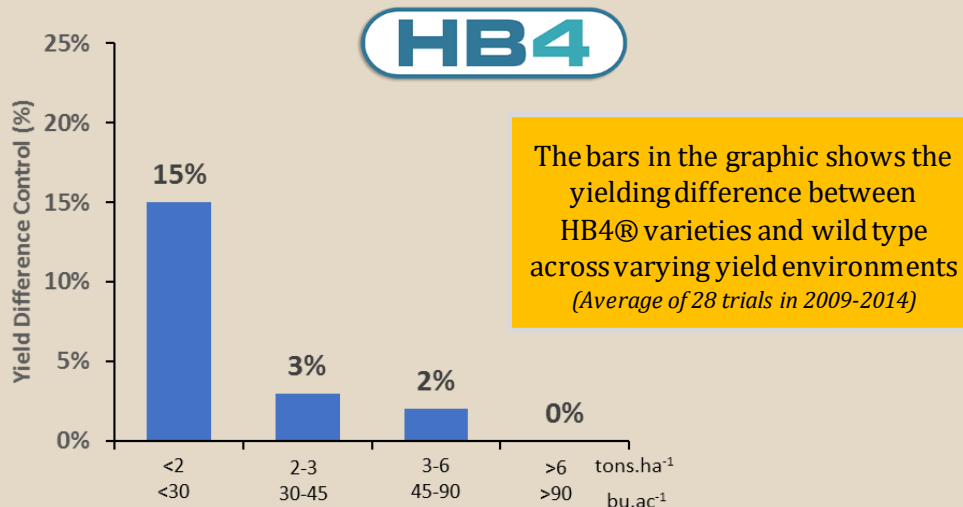
 Crops Insurance



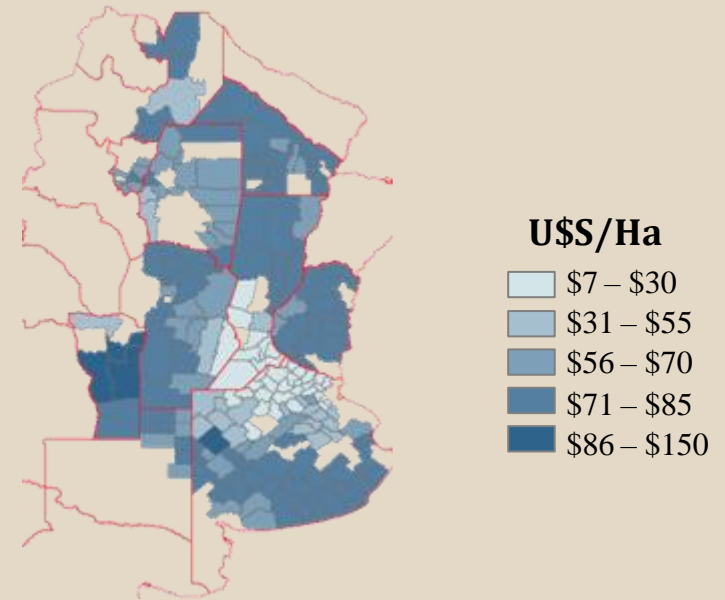
EcoSoy: First-to-Market, Drought-Tolerant Soybean

Fundamentals of HB4® Technology

- The HB4® technology grants drought and salinity tolerance to crops. Thus, the final yield gets improved under adverse conditions for cultivation.
- Another characteristic of HB4® is that no yield drag is observed under optimum growing conditions.



HB4® Technology Value



HB4® Variety Development

HB4® technology has been licensed to other companies to develop new varieties. This varieties will be added to the portfolio of each company

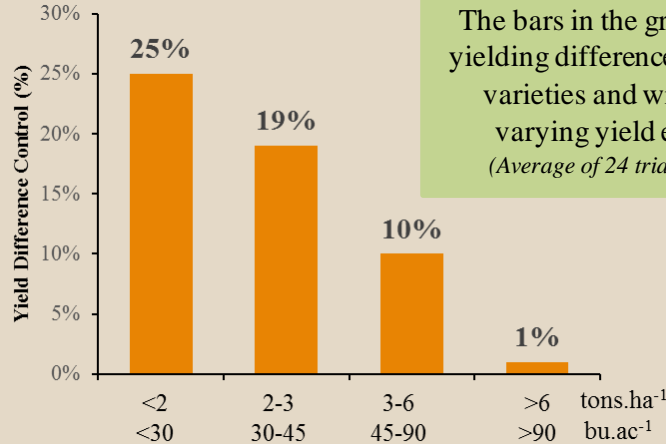


EcoWheat: First-to-Market, Drought-Tolerant Wheat

Fundamentals of HB4® Technology

- The HB4® technology grants drought and salinity tolerance to crops. Thus, the final yield gets improved under adverse cultivation conditions.
- Another characteristic of HB4® is that no yield drag is observed under optimum growing conditions.

HB4



The bars in the graphic shows the yielding difference between HB4® varieties and wild type across varying yield environments (Average of 24 trials in 2009-2013)



Fundamentals of HT Technology

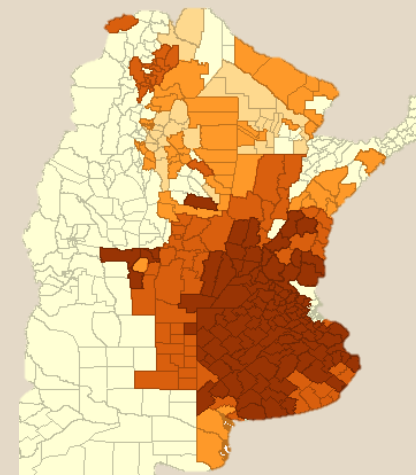
- The HT technology attached to HB4®, confers tolerance to the herbicide ammonium glufosinate at field doses.
- This technology offers a new way of weed control without penalties in yield or agronomic characteristics.

HT
HB4



Wild Type

HB4® Technology Value



U\$/Ha



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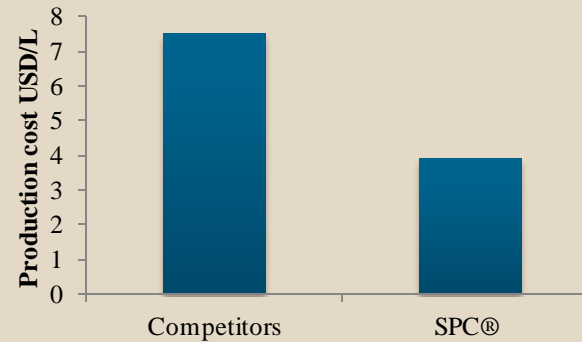
SPC Safflower-Produced Chymosin: A Platform Validating Technology

Technology Overview

- Produce Chymosin in GM Safflower seeds
- Co-purification of SPC with safflower by-products
- Cost competitive approach
- SPC approved for commercialization in Argentina
- Pending approval for by-products utilization
- Verified product quality through ~20.000 Tons of cheese produced using SPC
- Added-value byproducts for potential use in personal care and animal feed industries

Technology Development

Cost Reduction (SPC vs Competitors)



Chymosin Production Highlights

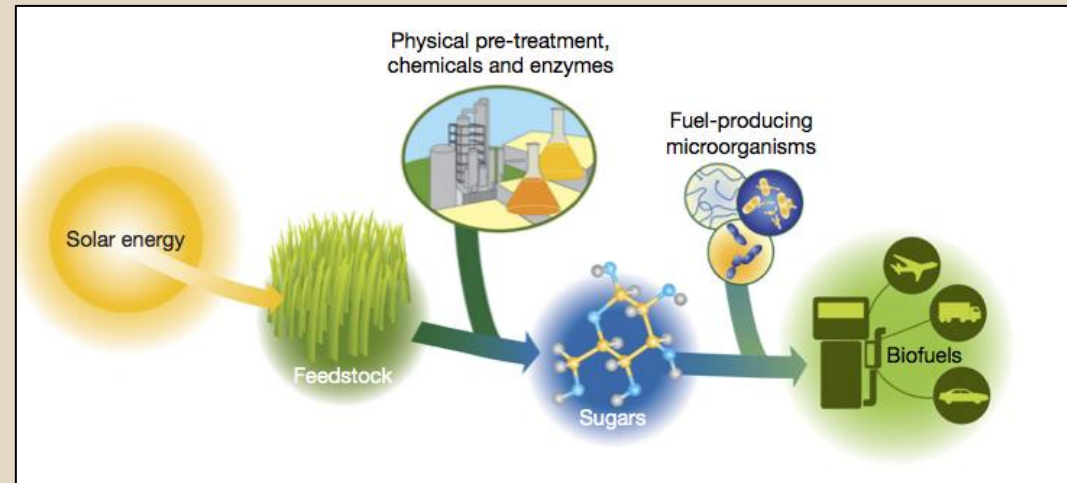
- Industrial production launched in 2016
- Dossier for deregulation in Argentina filed

SPCel Safflower-Produced Cellulases: Molecular Farming Opportunity

Technology Overview

- Collaboration with Y-Tec, YPF R&D subsidiary
- Key technology for 2nd generation bio-fuel industries
- Cost of enzymes is key for the 2nd generation bio-fuel industries
- Enhanced technology for the protein expression system in safflower seeds
- Robust pilot plant facility capable of producing different enzymes from safflower seeds
- Molecular farming platform enables low-cost production of proven enzymes
- Technology enables the use of cellulosic raw material for a variety of fermentation solutions

Technology Development



SPCel Program Highlights

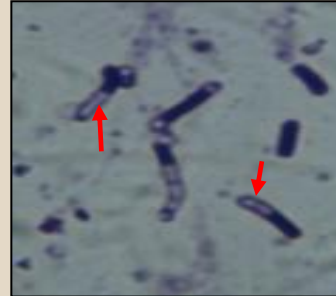
- 5 different types of cellulases
- 10x increase in protein expression in safflower seeds
- 10x estimated decrease in the cost of the enzymes
- SPCel Max expected to double productivity

Bacillus PHA / PHB Production Solution From Glycerine

Technology Overview

- Polymeric materials with plastic properties produced from renewable natural sources
- 100% biodegradable
- GM *Bacillus* strains optimized for PHB and PHB- copolymer production
- GRAS organism
- Cost-effective process
- High value molecules
- Low-cost Feedstock
- Opportunity (Rosario area is one of the top world producers of Glycerine from soybean)

Technology Development



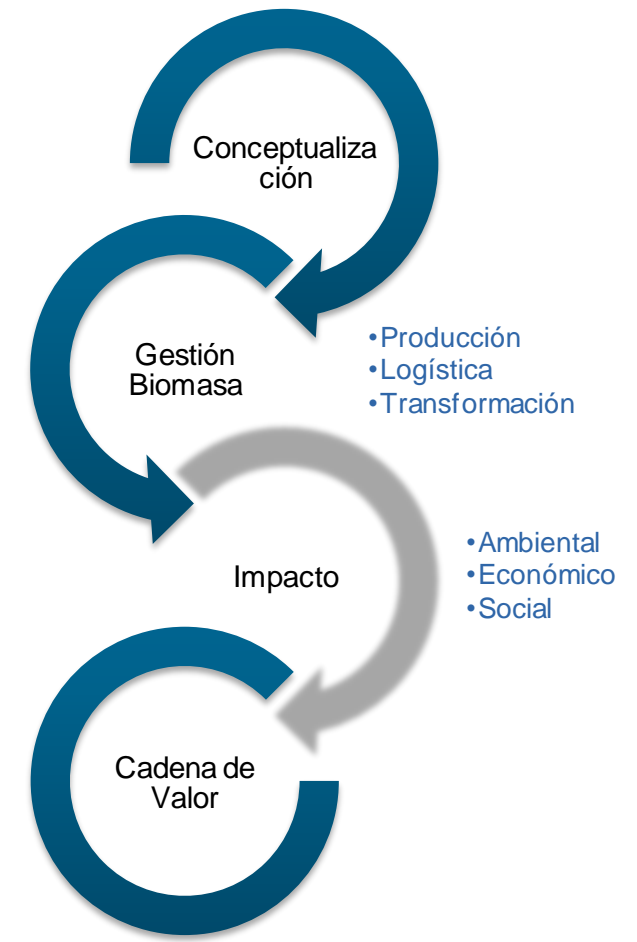
PHA/PHB Production Highlights

- Technology tested from 1 to 1200 liter production scale
- 10 kg pilot scale plant installed
- 1M liter production biorefinery integrated to biodiesel plant expected for 2019-2020

Integramos Jugadores Clave para Desarrollar Bio-Empresas

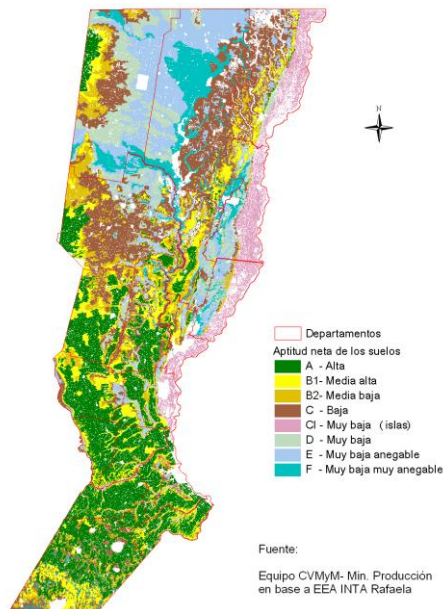


Resumen Proceso



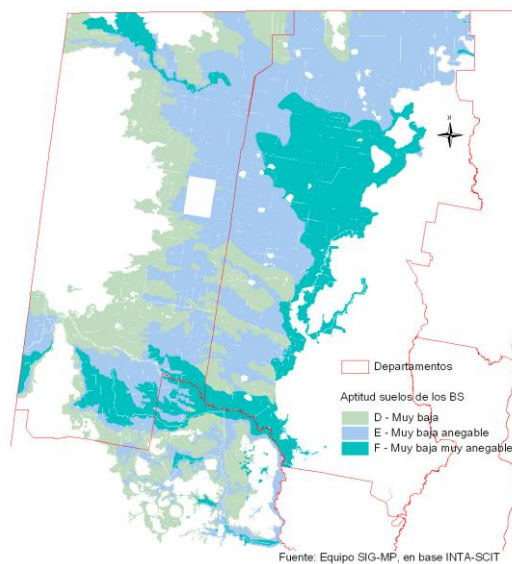
PROVINCIA DE SANTA FE

APTITUD AGROPECUARIA NETA DE SUS SUELOS



ZONA DE LOS BAJOS SUBMERIDIONALES

APTITUD PRODUCTIVA DE LOS SUELOS

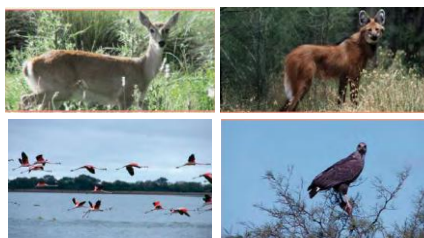


Cambiamos el Paradigma?



Bionegocios Sustentables : Un Nuevo Pradigma en Valor Agregado

Espartillo
Bajos Submeridionales



Servicios Ambientales



Ganadería

15 USD/ton

Gasificación



180 USD/ton



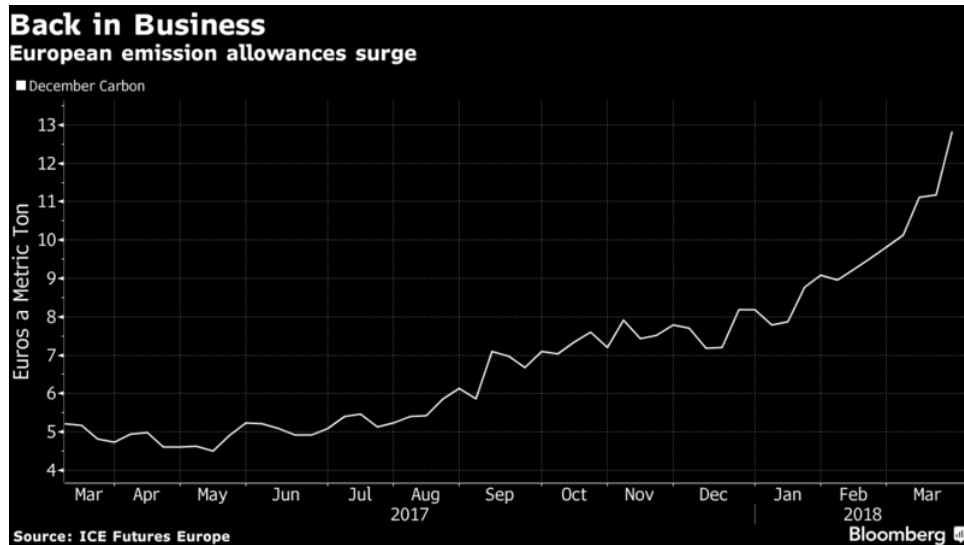
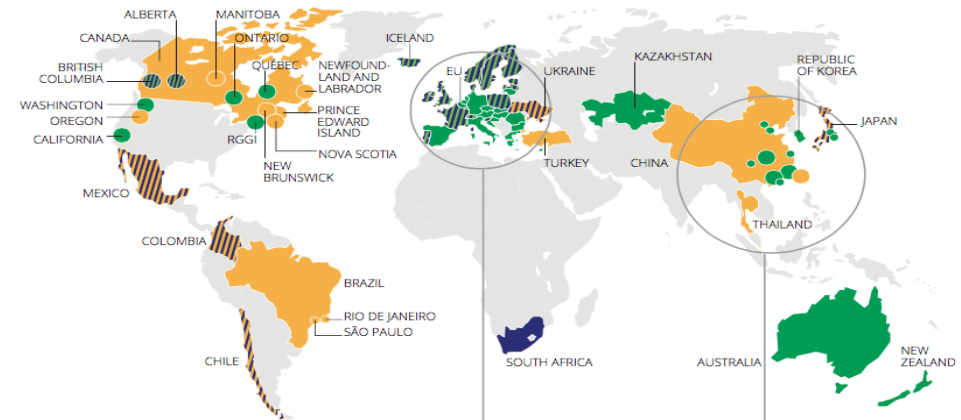
Electricidad 3 Megas	Espartillo
Biomasa a cosechar (ton/año)	34.000
Superficie necesaria (has)	17.000
Ingreso por energía (USD/año)	4.680.000
Equipamiento maquinaria	56
Mano de obra	80



Impacto Ambiental

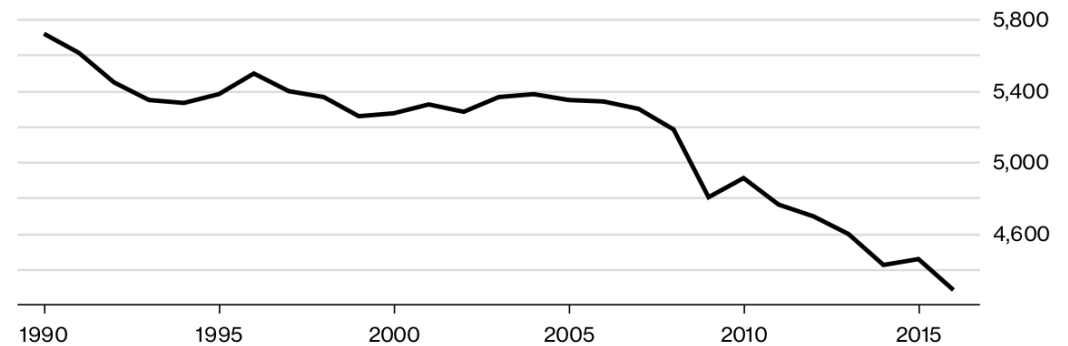
Electricidad 3 Megas	Espartillo	Diesel
kg/MWH	1.000	212
kg CO2/ton	3	665
Ton CO2/año	77	17.252
Equivalente Auto	8.588	
Valor CO2 USD/año (14 USD/ton)	240.000	

Mercados de Carbono



EU emissions fell 24%

Million tons CO2 equivalent



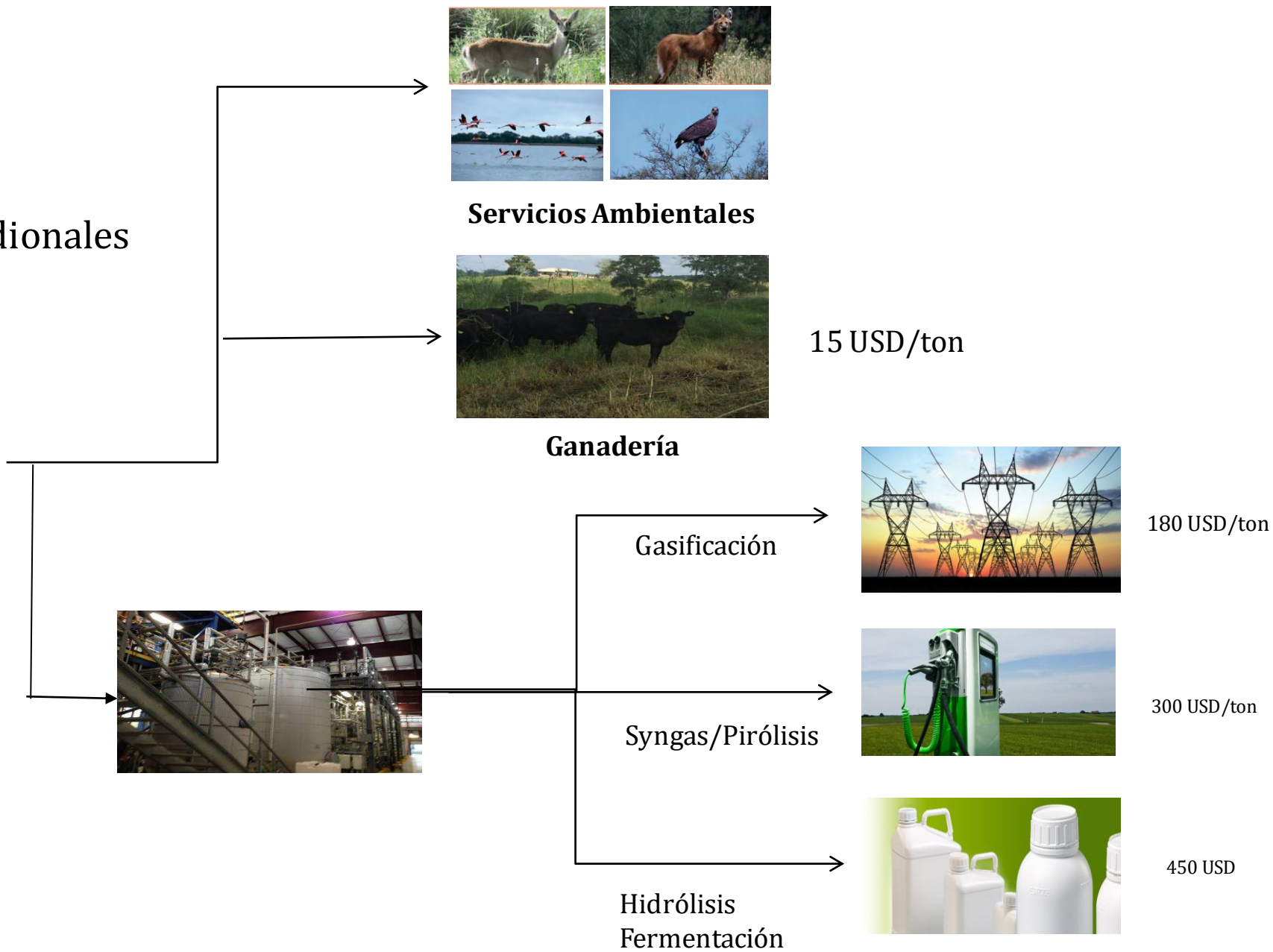
Source: European Environment Agency

Bloomberg

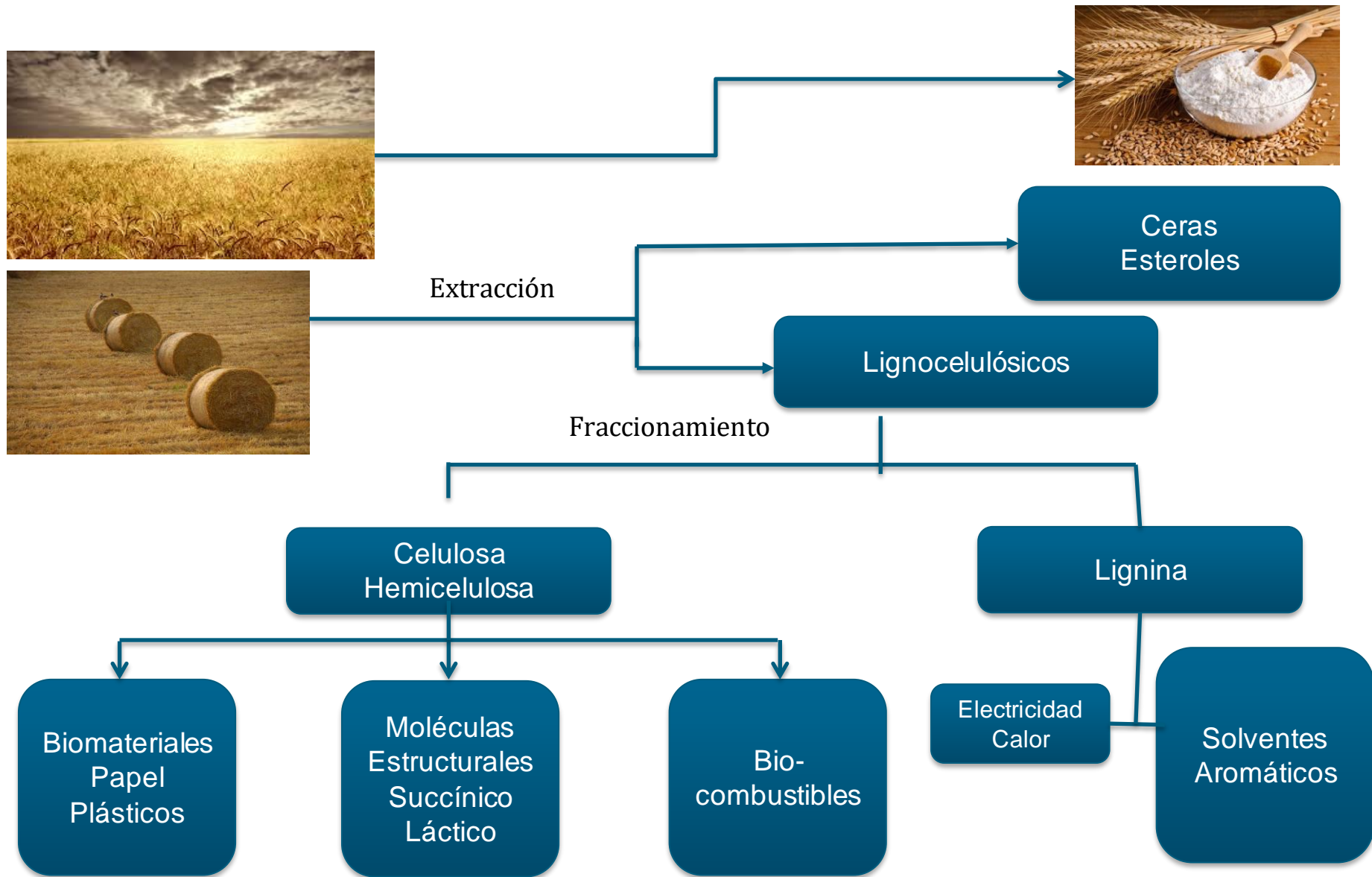


Bioeconomía : Un Nuevo Pradigma en Valor Agregado

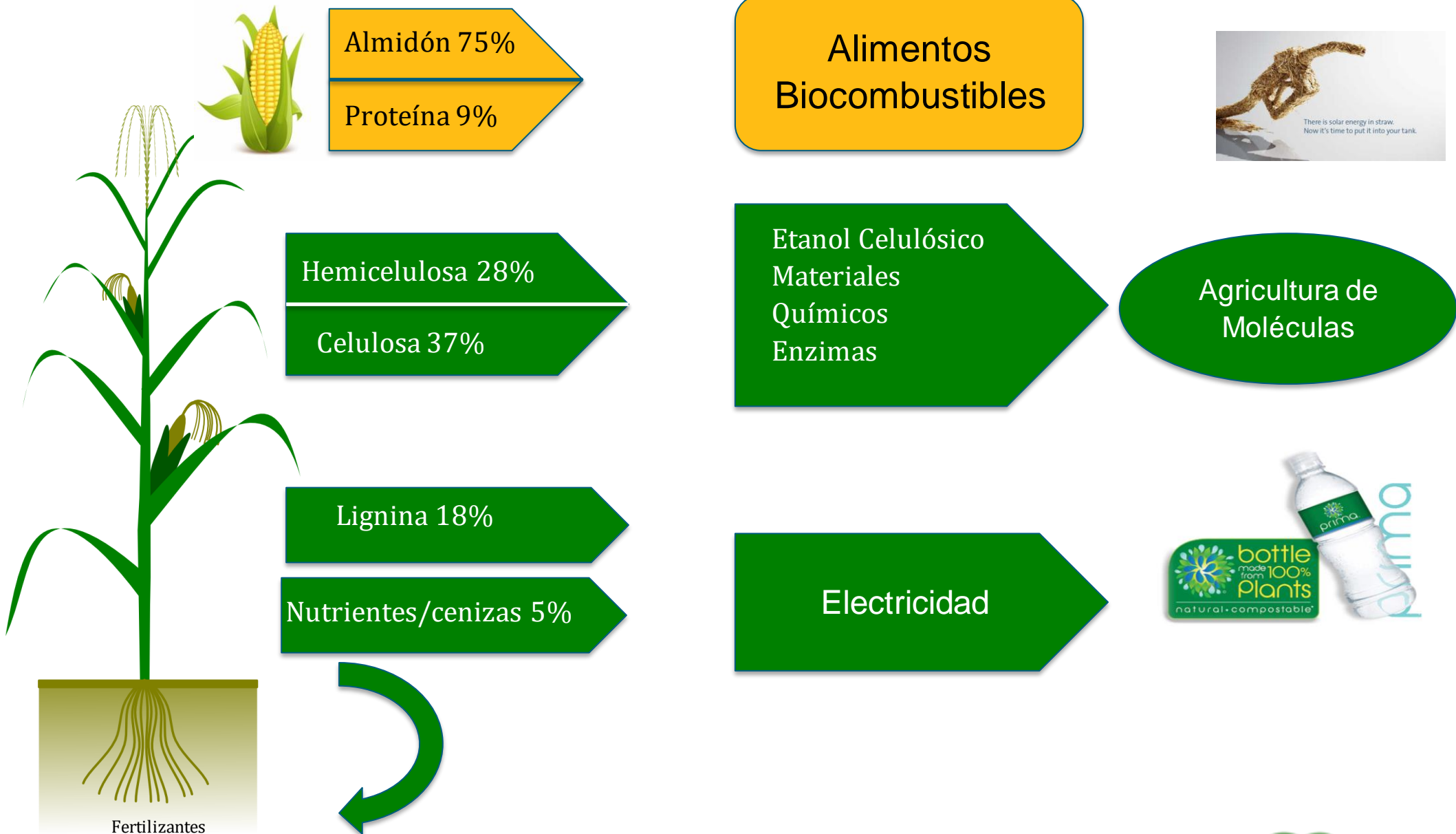
Espartillo
Bajos Submeridionales



Agricultura Post Granaria: Rastrojo Trigo

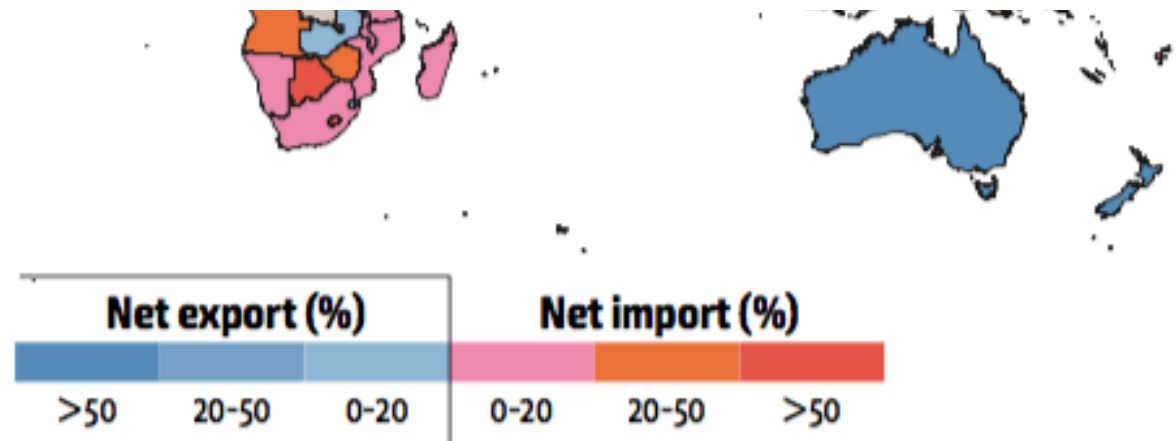
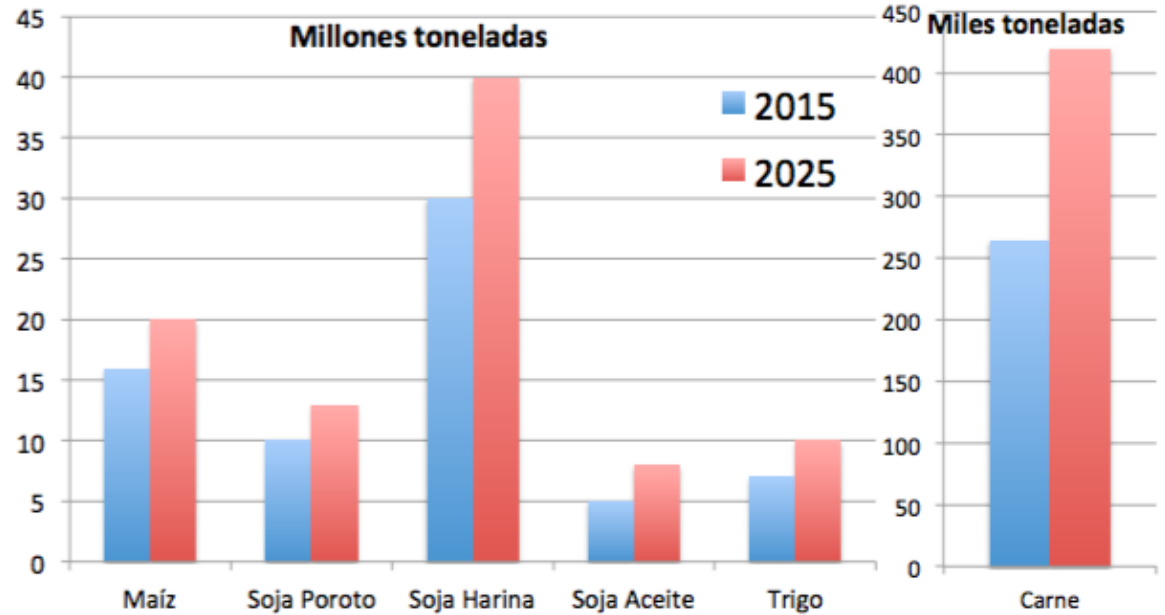
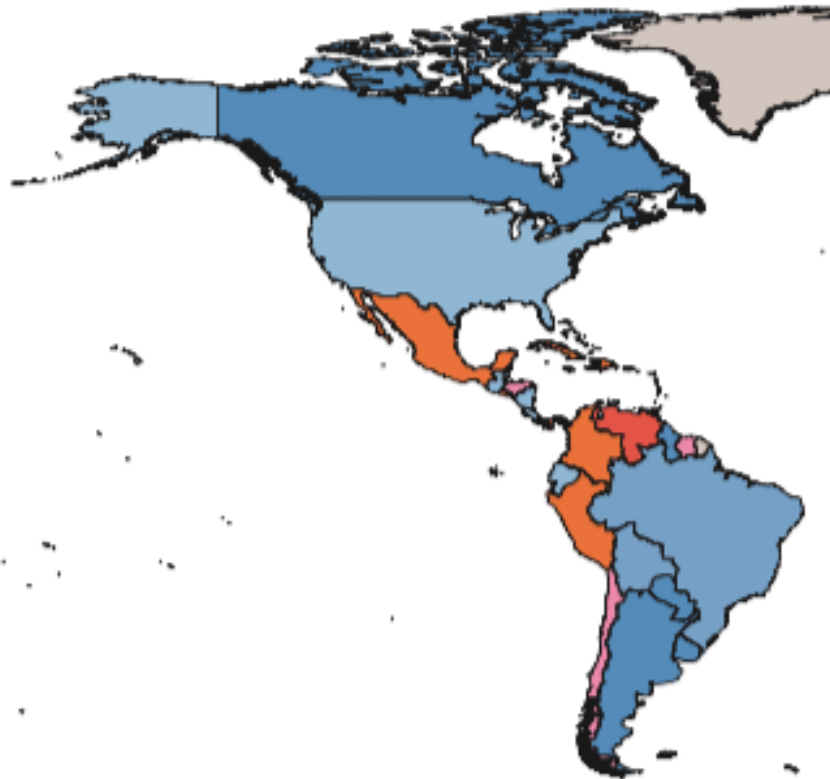


Agricultura Post Granaria: rastrojo maíz



Exportador Líder de Alimentos

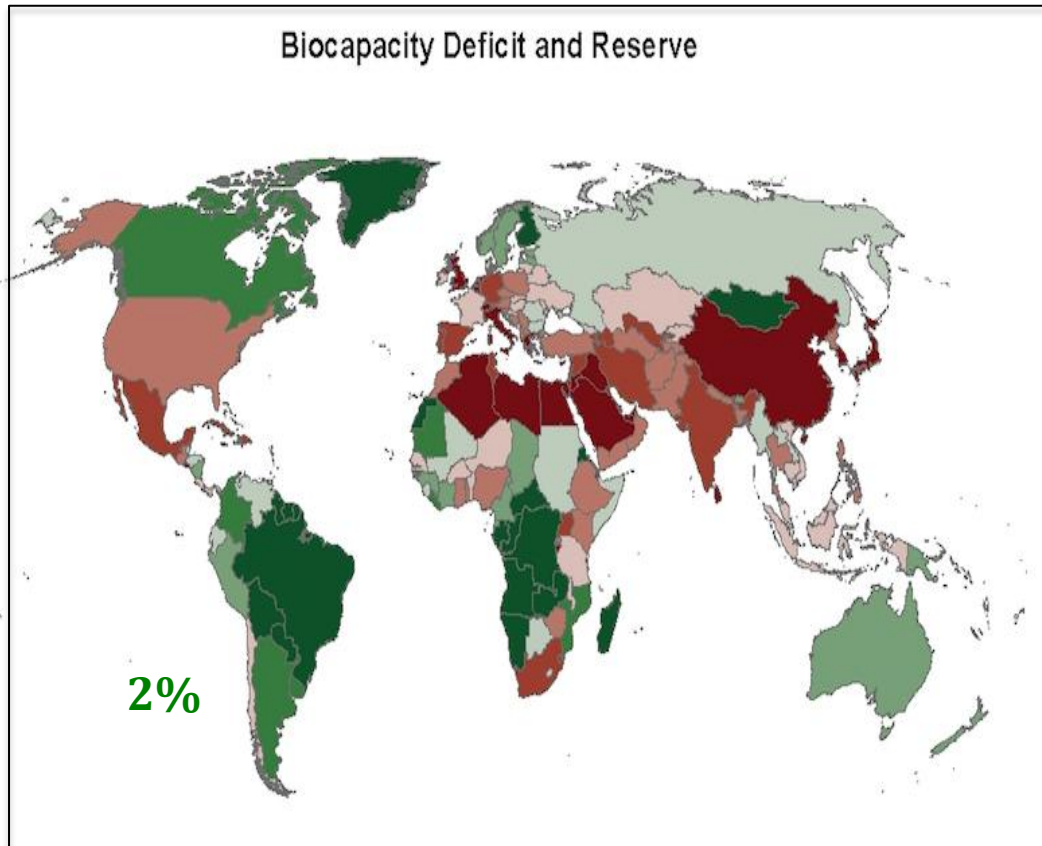
Figure 2.12 Percentage of net food import in total calories



Source: FAO Global Perspectives Studies, using 2011 food balance sheets from FAO, 2016a.



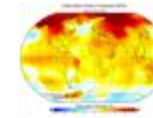
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Porque Bionegocios



Menor dependencia de combustibles fósiles



Mitigación del Cambio Climático



Rentabilidad
Diversificación



Aprovechamiento circular
De recursos

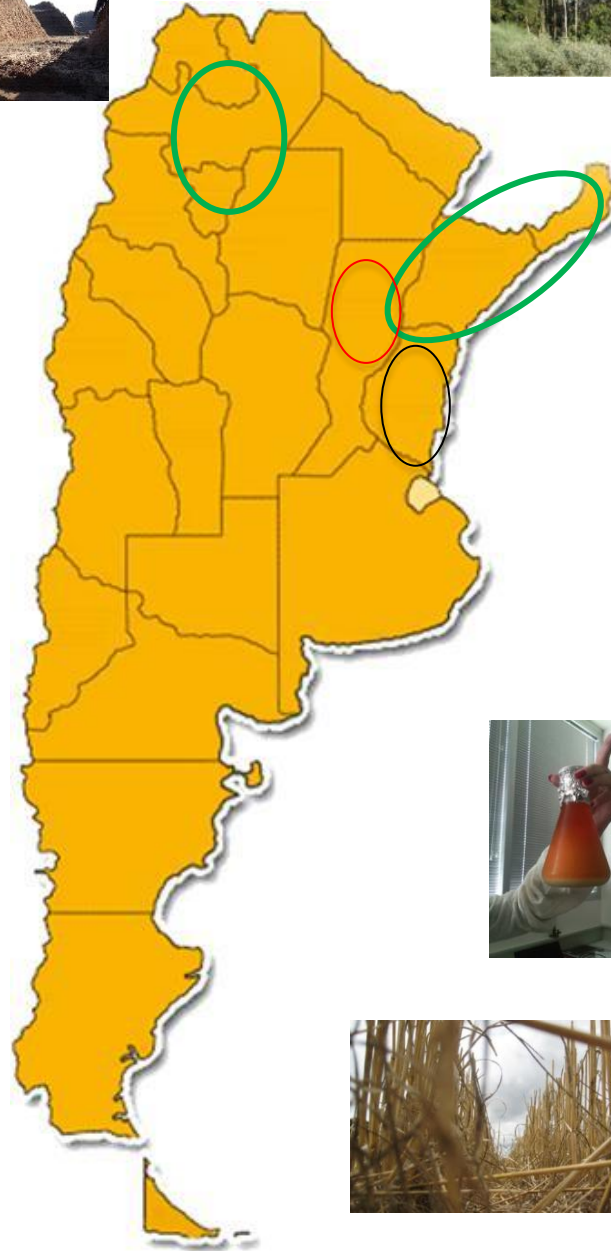


Economía de repetición
Valor agregado local



Basada en innovación

Estrategia Complementaria: Bionegocios Sustentables



No importa de cuantos recursos dispongas,

Muchas Gracias



si no sabes utilizarlos, nunca serán suficientes