Science For A Better Life

Integrated Strategies for Crop Protection: Biologics in a Global Multinational

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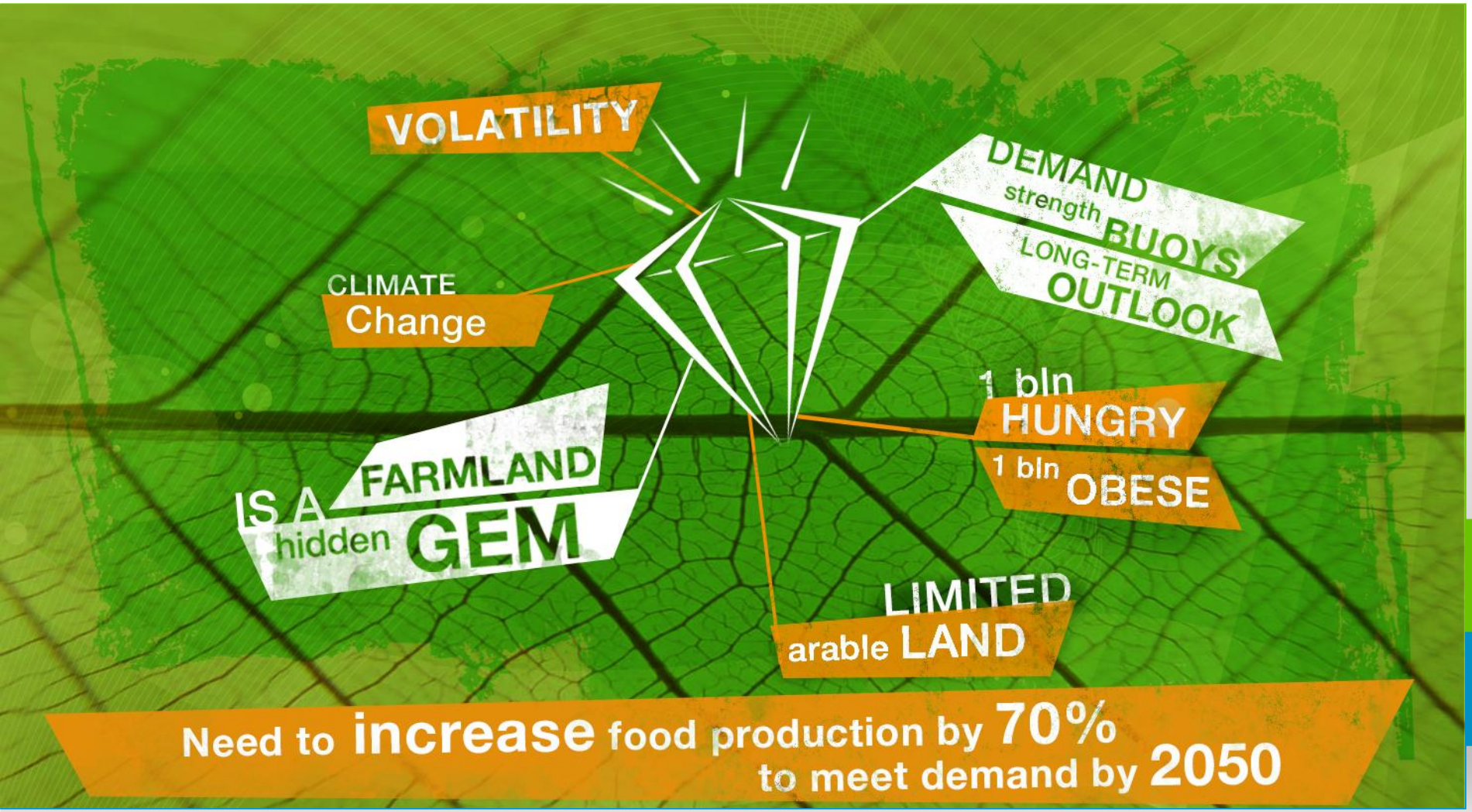
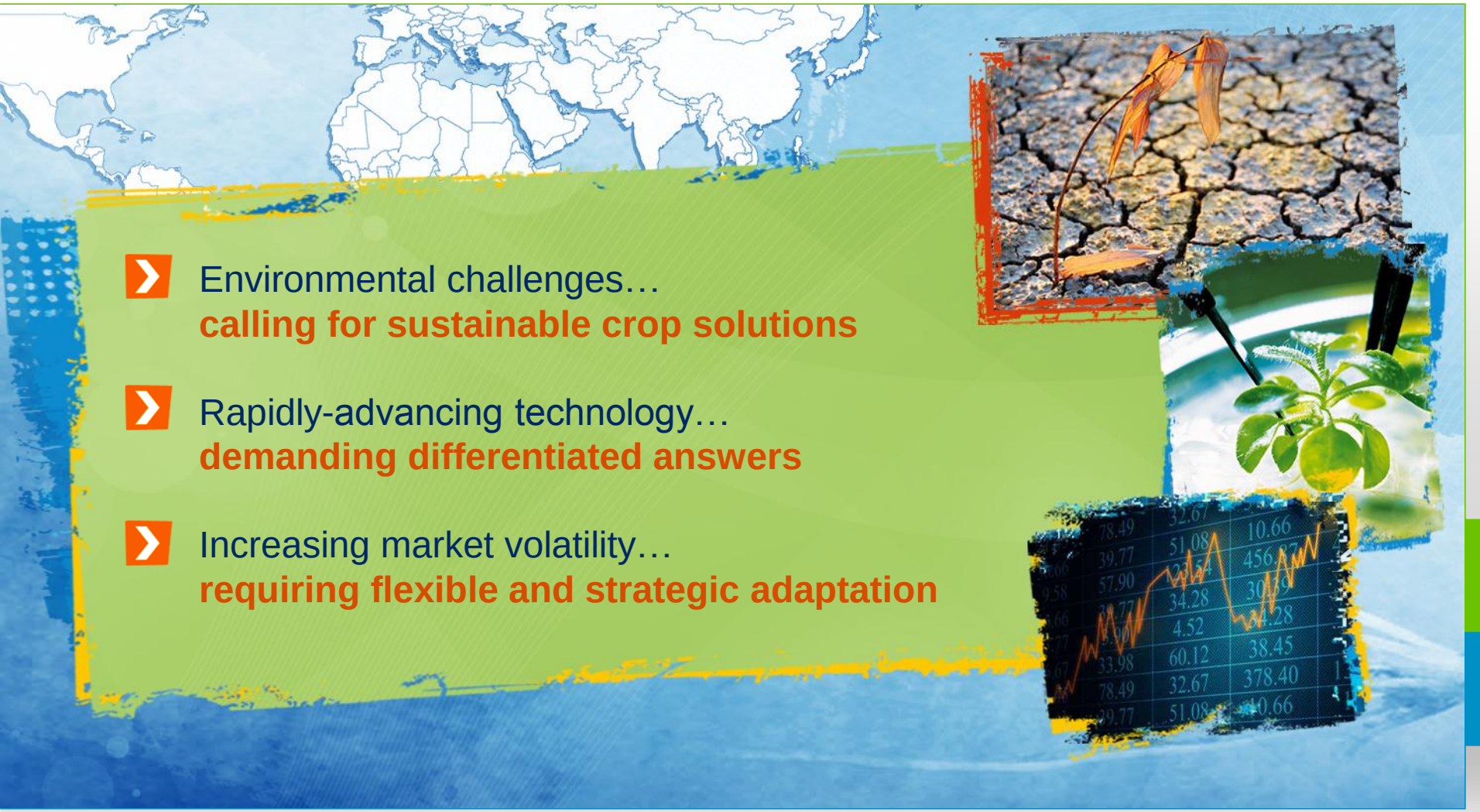
Content

- **Market Divers**
- Bayer CropScience's Strategy: an integrated approach
- Customer-centric & integrated R&D
- World-class product supply
- Integrated solution: an example

We continue to operate in a challenging and opportunity-rich landscape



Looking ahead: We continue to see opportunity-rich market dynamics



- Environmental challenges…
  calling for sustainable crop solutions
- Rapidly-advancing technology…
  demanding differentiated answers
- Increasing market volatility…
  requiring flexible and strategic adaptation

What is Different?
Current Market Drivers

Drivers for Sustainable or Low Chemical Agricultural are strong and could create a demand of c. $10bn by 2020

Reduced Residue

Driven by Consumers, Retailers & Global trade

Biologic products replace conventional products allowing growers to meet MRLs

$2-3bn

Resistance Management

Driven by Manufacturers

Biologic products make ideal partners to conventional products to reduce development of resistance

$2-3bn

Regulatory Pressure

Driven by Regulators & NGOs

Regulatory authorities are in the process of de-listing some of the more toxic, older pesticides

$3-7bn

Plant Health & Increased Yield

Driven by Manufacturers & Growers

New technologies to boost the health and quality of plants leading to increased yields

$6-7bn

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We're leveraging the full potential of these opportunities

- To beat expectations for sustainable answers…
  we're aiming to lead the way in Sustainable Crop Solutions
- In response to demands for differentiation…
  we're heavily investing in robust R&D technologies
- To thrive despite increasing market volatility…
  we're building up world-class Product Supply

Leading in Sustainable Crop Solutions:

Sustainability in food production is a future mega trend

- Customers expect **safer and "sustainable" food**
- Global retailers have more stringent **residue reduction targets**
- Tougher regulations and registration of synthetic products; **higher demand for biologics**
- Biologics often **effective in very small quantities**
- The broader **biologics market** forecast **to triple** to almost 4 bn USD by 2020

food chain partnership

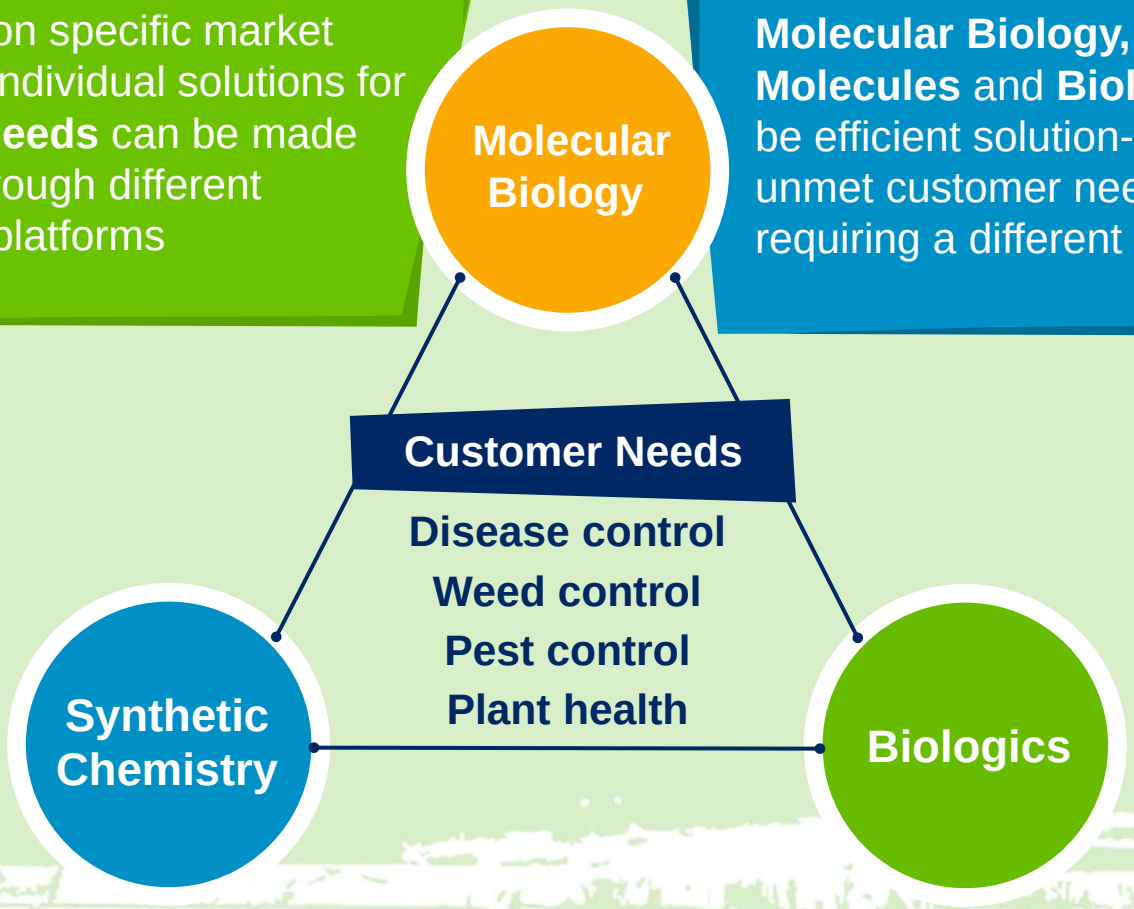
Walmart

PEPSICO

With AgraQuest, we have all competencies to lead in Sustainable Crop Solutions

Depending on specific market conditions, individual solutions for **customer needs** can be made available through different technology platforms

Molecular Biology, Small Molecules and **Biologics** can be efficient solution-providers for unmet customer needs - each requiring a different expertise



With AgraQuest, we have all competencies to lead in Sustainable Crop Solutions

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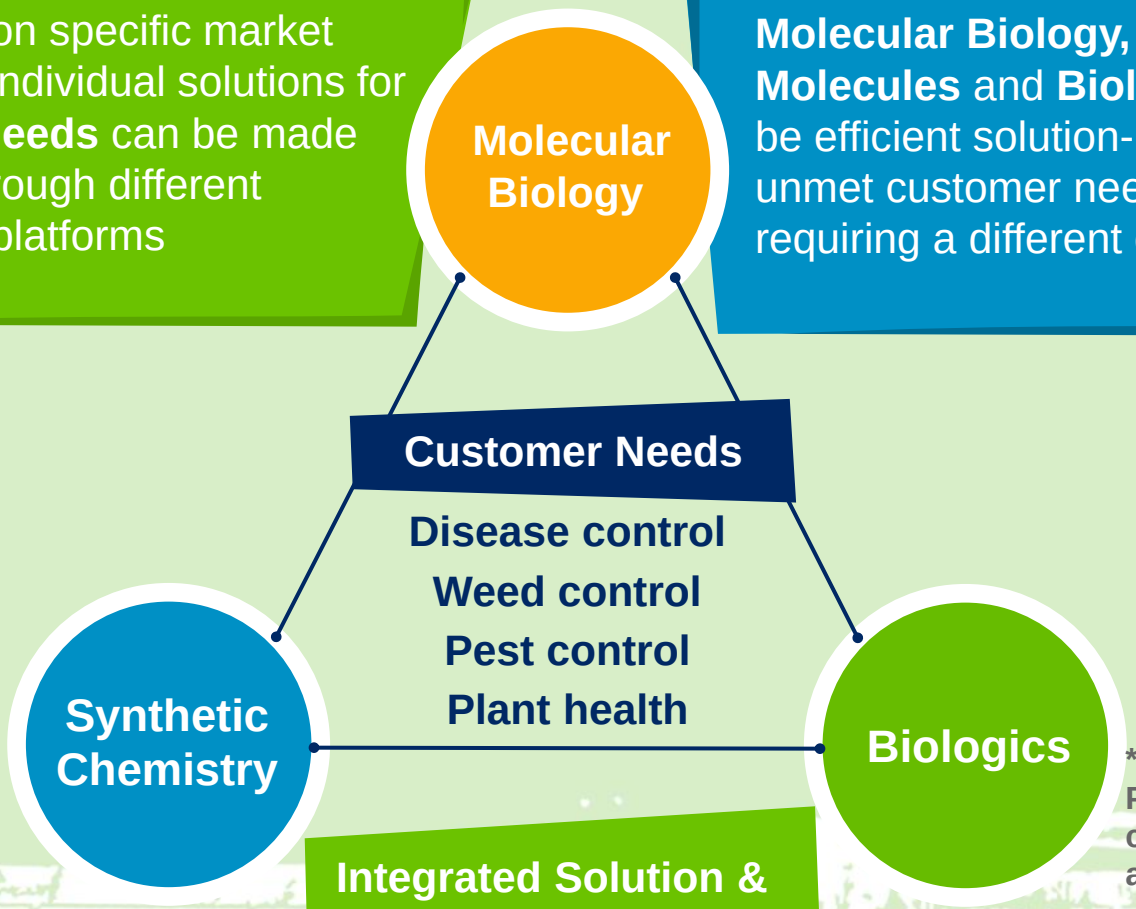

*** Also known as Green Products. Suitable for conventional and organic agriculture**

In 2011, we launched a four-pillar strategy to pave the way for sustainable success

1 Rejuvenate the core Crop Protection business

- Streamlining and enhancing our Crop Protection portfolio
- Focusing on flexibility and efficiency

2 Reinvent customer-centricity along value chain

- Driving commercial excellence in marketing and sales
- Customizing offerings and developing differentiated solutions

3 Rebalance and refocus innovation

- Striving for 50:50 in R&D for Seeds/ Biologics and Chemistry by 2016
- Innovating convergence between chemistry and biology

4 Extend Seeds footprint in focused crops

- Strengthening position in established crops
- Extending portfolio in e.g. soy, wheat, oilseeds

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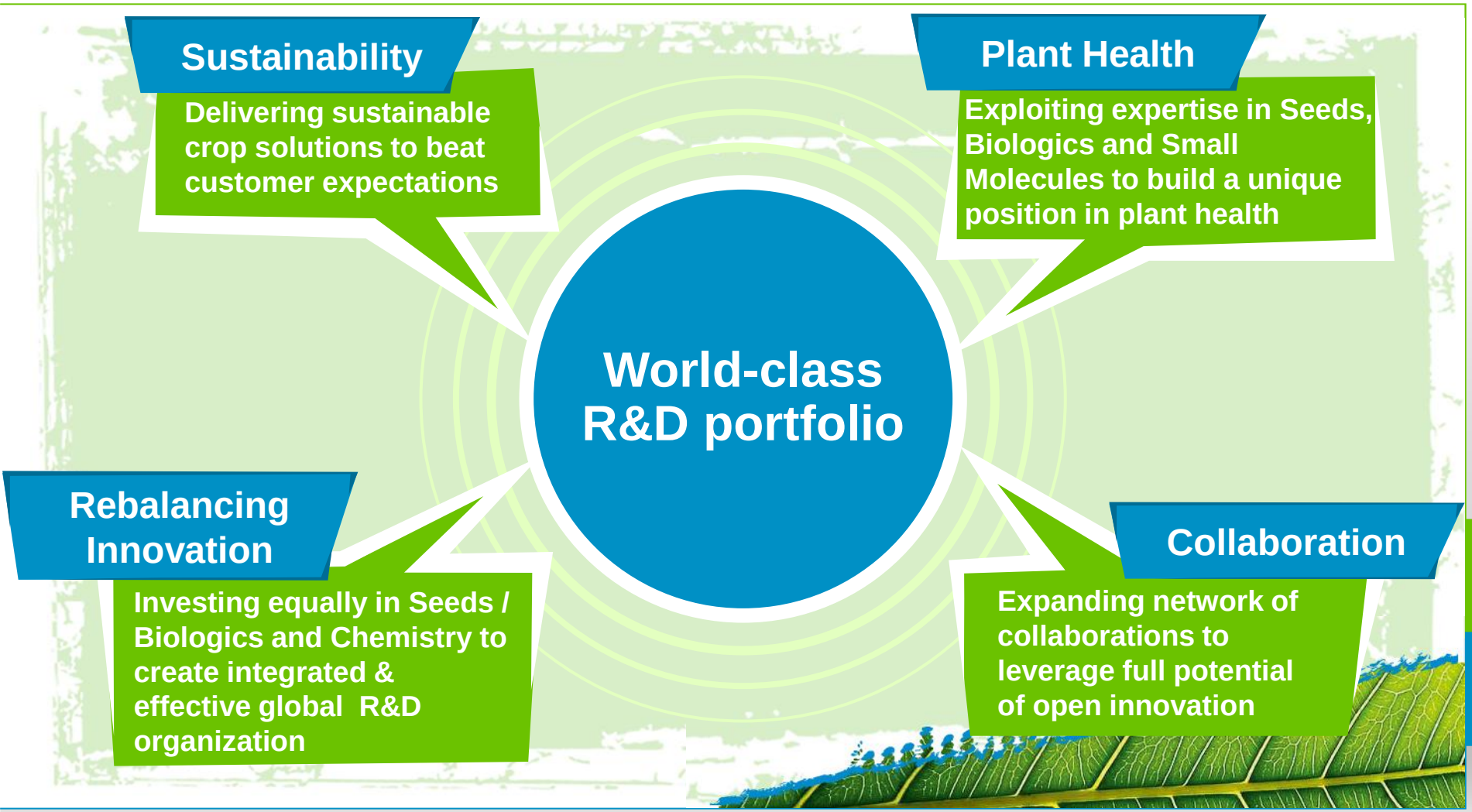
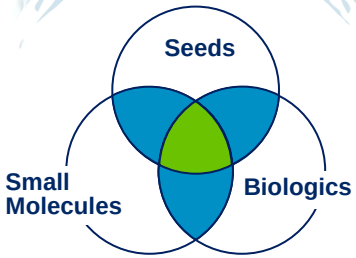
Investment of €5 bn in R&D from 2011-2016 will fuel delivery of new global R&D strategy



Our R&D operations boast a unique combination of Seeds, Small Molecules and Biologics

Integrated approach



Traits
- Agronomic traits
- Germplasm
- Biotech

Breeding

Chemicals
- Insecticides
- Fungicides
- Herbicides

Biologics
- Bacteria
- Naturals

Combining state-of the art techniques

- Computational life science
- Phenotyping, field trials
- Genome sequencing
- Gene expression

- Genes of interest
- Specific molecular targets

- Marker assisted breeding
- Trait selection chemistry
- Microbial strain collection

Commercial deployment

Next generation product

Integrated plant health solution

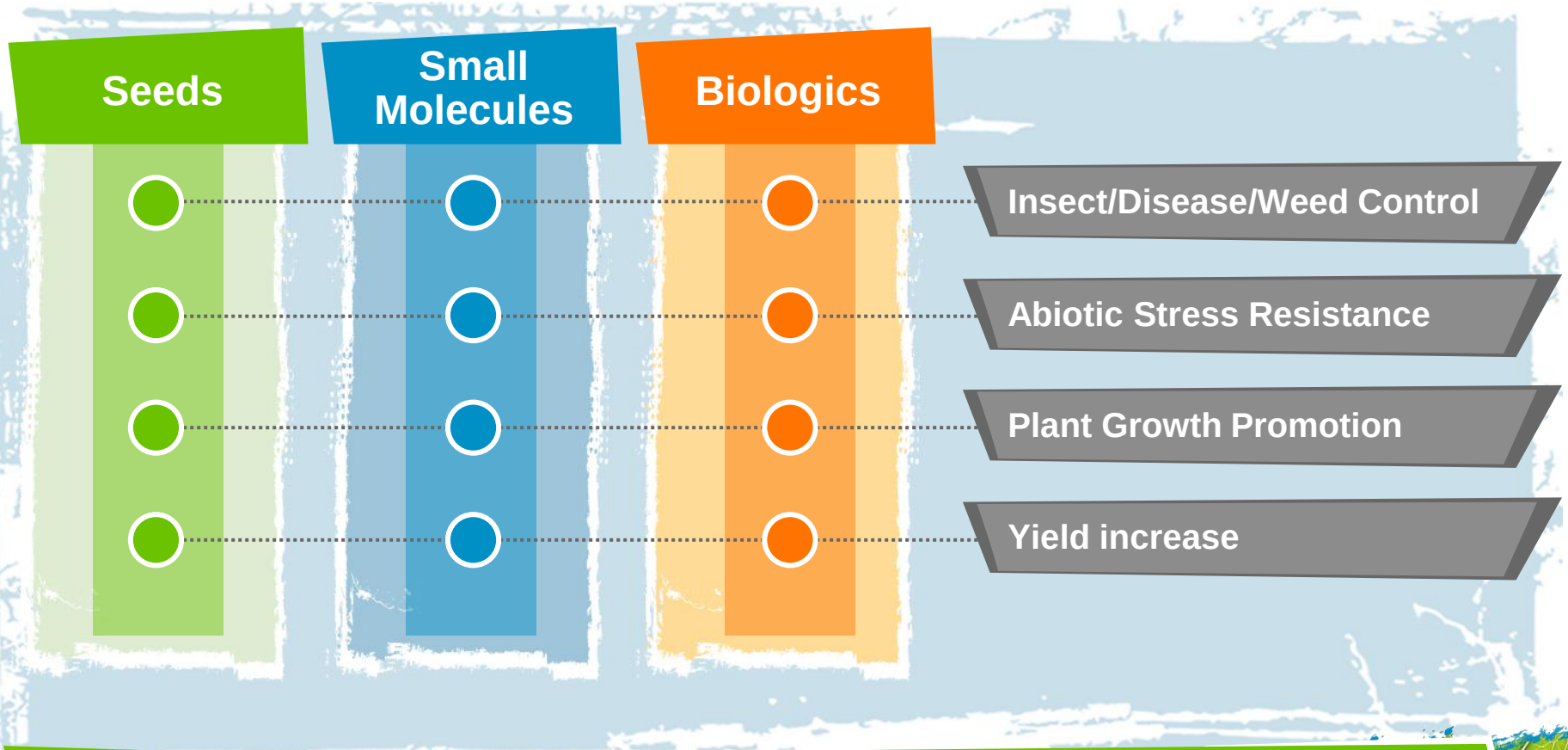
Collaboration with best-in-class organizations

Regulatory excellence

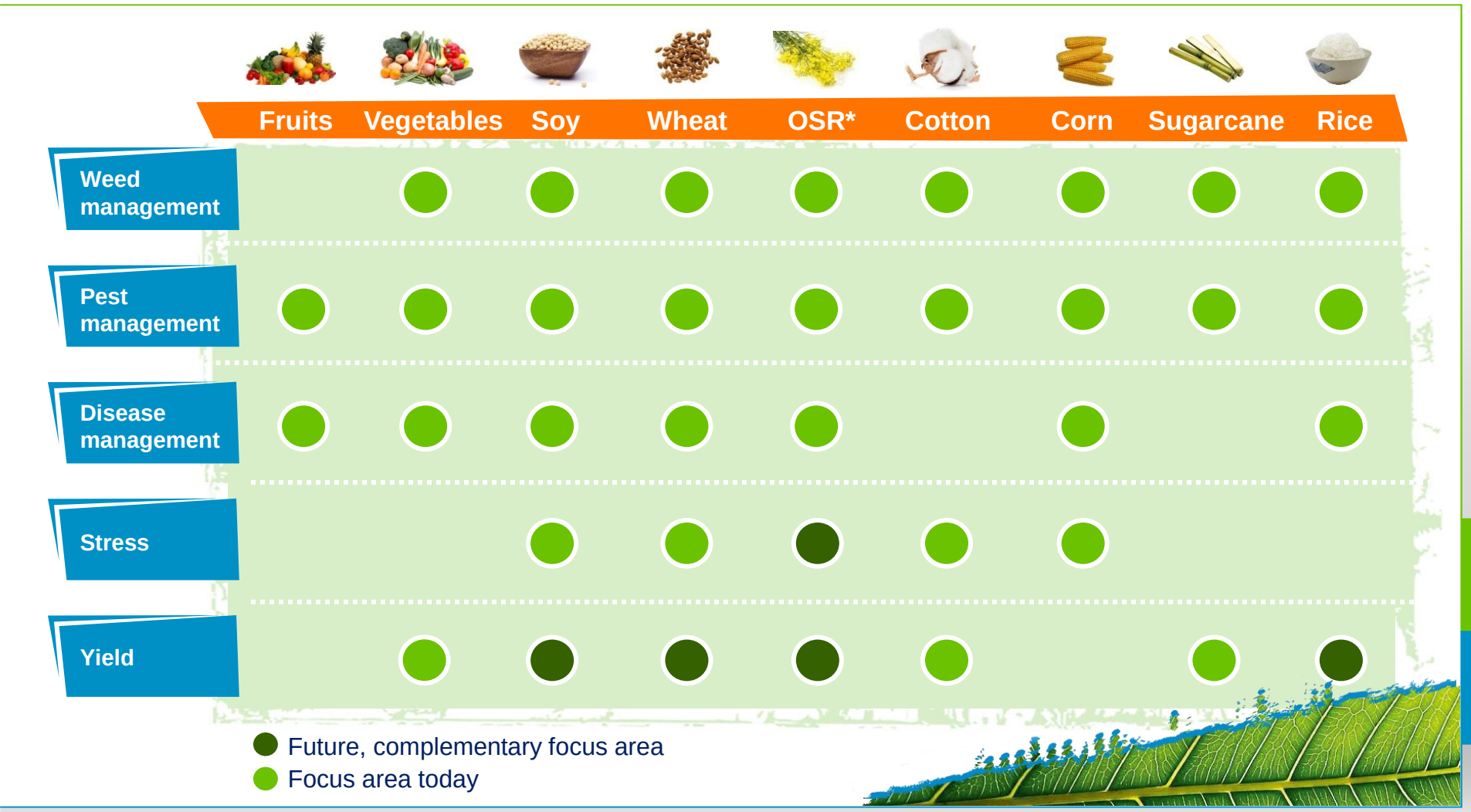
Bayer CropScience R&D strategy

- Bayer CropScience has established the **best R&D portfolio** in the Ag industry, delivering **differentiated solutions meeting customer needs**
- We will focus on obtaining **timely regulatory approvals** and **optimizing lifecycle management** whilst building and delivering our pipeline
- Bayer CropScience R&D strategy has 4 core elements:
  - **Deliver differentiated & sustainable crop solutions** which are first- or best-in-class
  - **Exploit our expertise in Seeds, Small Molecules and Biologics** to build a unique position in plant health
  - Further develop our integrated and **effective global R&D organization**
  - Develop a **world-class external network**

Our R&D strategy establishes **Biologics** as a third focus area to deliver integrated customer solutions



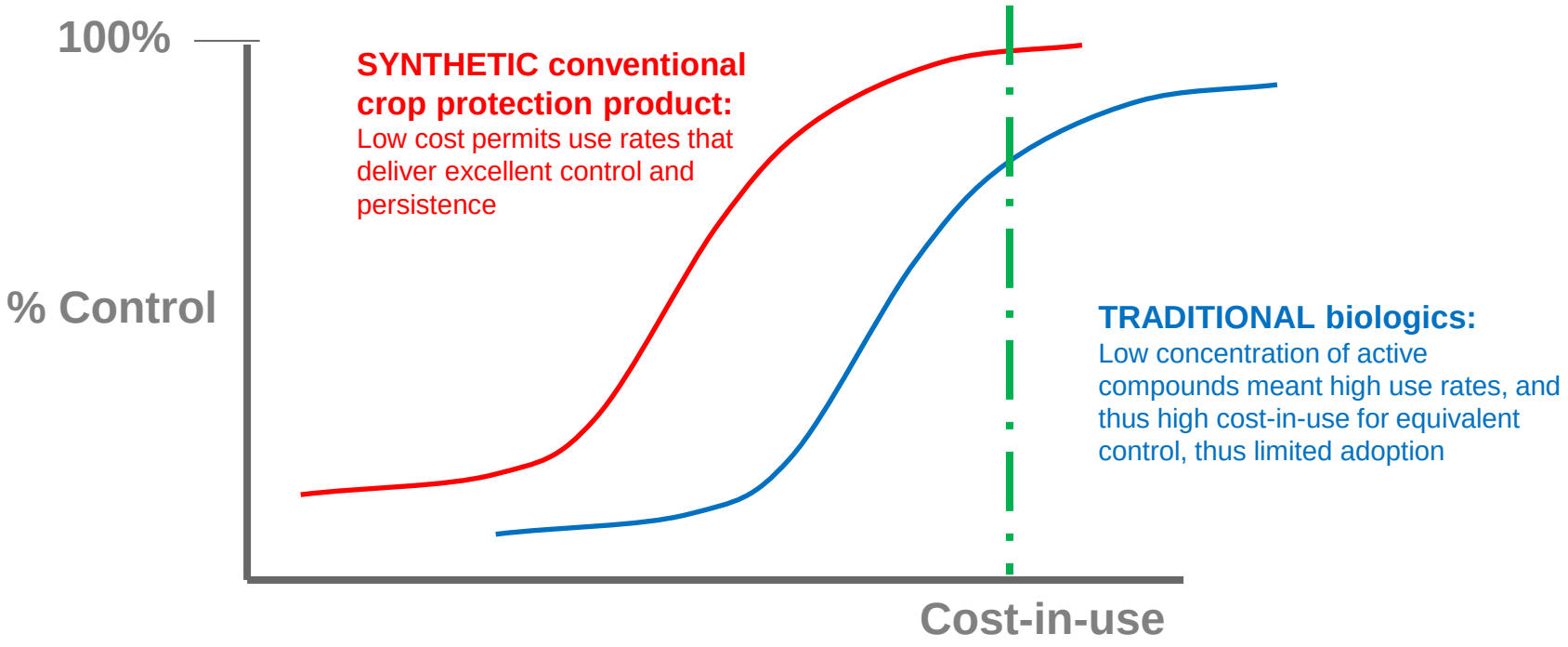
Delivering first- and best-in-class solutions for core crop needs



*Oilseeds rape

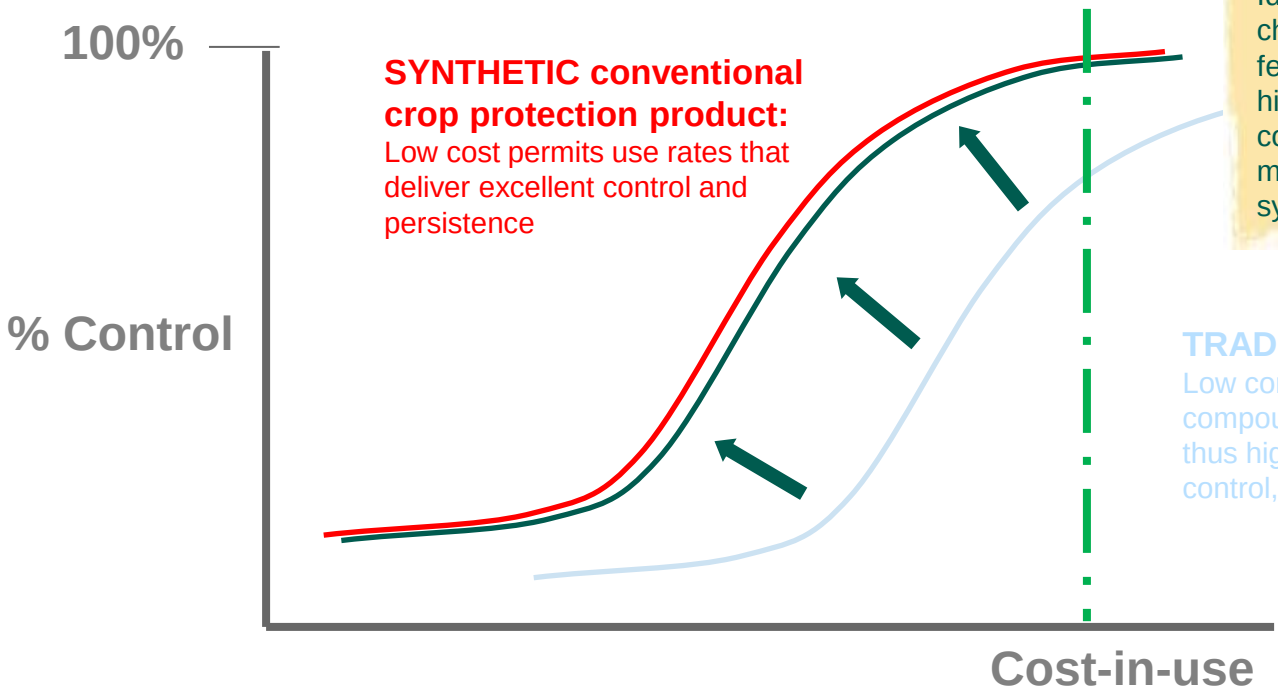
Historically, Biologic products over-promised and under-delivered

Traditional biologic products were high-priced and had only niche uses



AgraQuest capabilities deliver next generation performance

Microbial genetics, chemistry & fermentation enhances yield and reduces COG



SYNTHETIC conventional crop protection product:
Low cost permits use rates that deliver excellent control and persistence

MODERN biologics:
Identification of natural products chemistry, genetic tools and fermentation improvements drive higher concentration of active compounds and lower COGs, thus matching the cost-in-use and control of synthetics

TRADITIONAL biologics:
Low concentration of active compounds meant high use rates, and thus high cost-in-use for equivalent control, thus limited adoption

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We continue to serve customers worldwide with our expanding global footprint

*Research Triangle Park

We are ensuring a world-class Product Supply by investing € 2bn from 2011 to 2016

Optimizing supply chain model to increase flexibility and thrive despite volatility

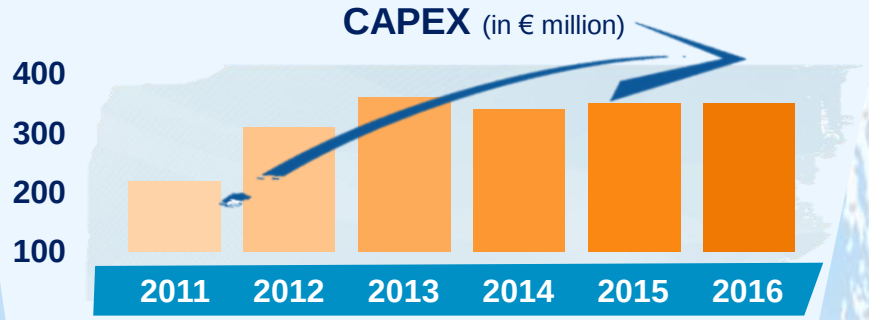
- **Building up capacity for top Crop Protection brands including:**

basta Liberty | NATIVO FOX | PROSARO

- **Expanding infrastructure for Seeds business** (breeding stations and seed production facilities)

- **Continuing to defend cost leadership by focusing on Operational Excellence**

Accelerating our Capital Expenditures*



*Property, plant and equipment

We are investing ~ €2 bn in assets (2011–2016) to foster future growth

~ €1.3 bn
Product Supply

- Capacity expansion
- Consolidation multi-purpose unit
- Advanced process technology

~ €0.2 bn
Research & Development

- Seeds innovation in RTP/USA
- Modernization of chemical research center in Monheim/Germany
- Building up Biologics in Davis, USA

~ €0.5 bn
Seeds

- Breeding Stations
- Greenhouses
- Seed processing facilities

~ € 2 bn

Farmers are at the center of our efforts to turn global challenges into opportunities

Our farmer focus

EMPOWERING farmers to become **“agripreneurs”** with tools & training

ENABLING progress by **investing** in **innovation** and technology

ENHANCING partnerships by **collaborating** from seed to shelf

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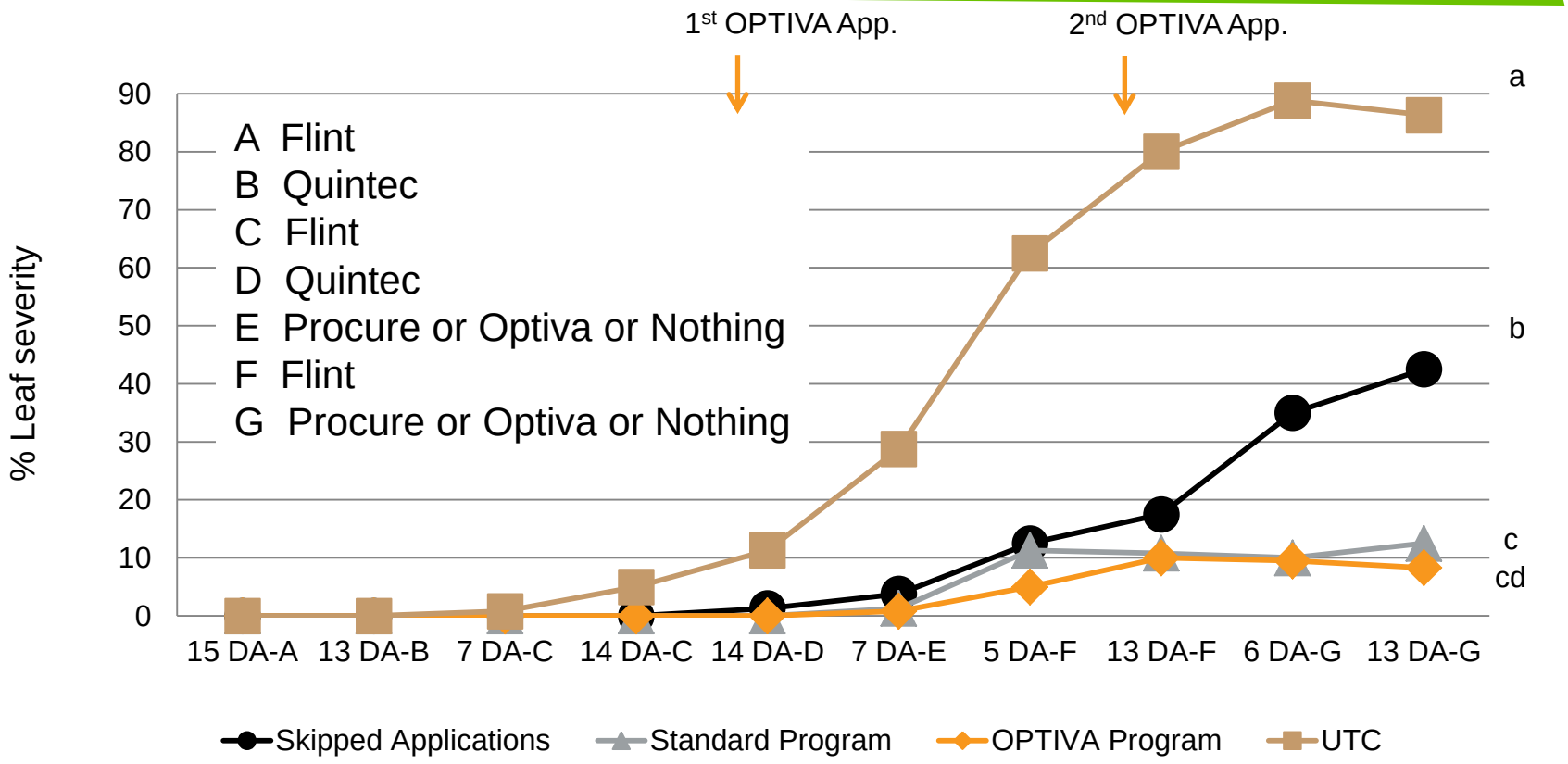
OPTIVA®: Performance equivalent to market leading fungicides

OPTIVA® performs as well as Triflumizole for control of Mildew on Grapes

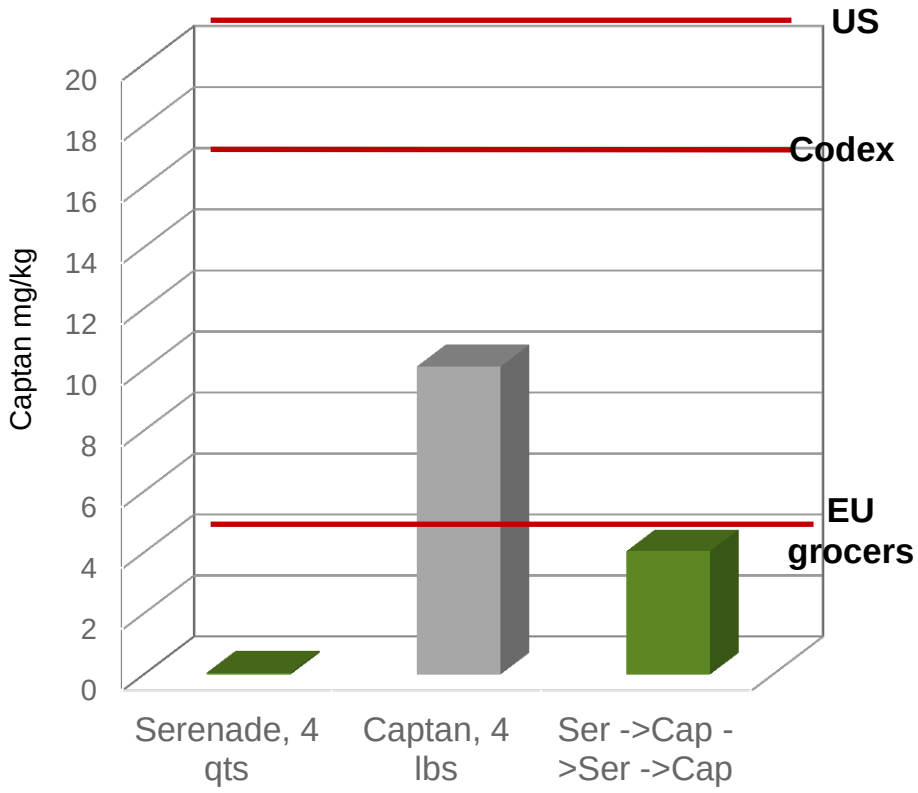


V. Fischer, Columbia Ag Research, Hood River, OR – 2010. Materials were applied using a CO2 handgun sprayer equipped with one D6 hollow cone nozzle per row delivering 70-180 GPA at 100 psi. Standard Program: Flint 1.5oz (ACF) Quintec 5floz (BD) Procure 6floz (EG). Optiva Program: Flint 1.5oz (ACF) Quintec 5floz (BD) Optiva 1lb (EG). Skipped Applications: no app at timings E & G. A = 5/19, B = 6/3, C = 6/16, D = 6/30, E = 7/15, F = 7/29 and G = 8/12. **Erysiphe necator*.(10-06-509)

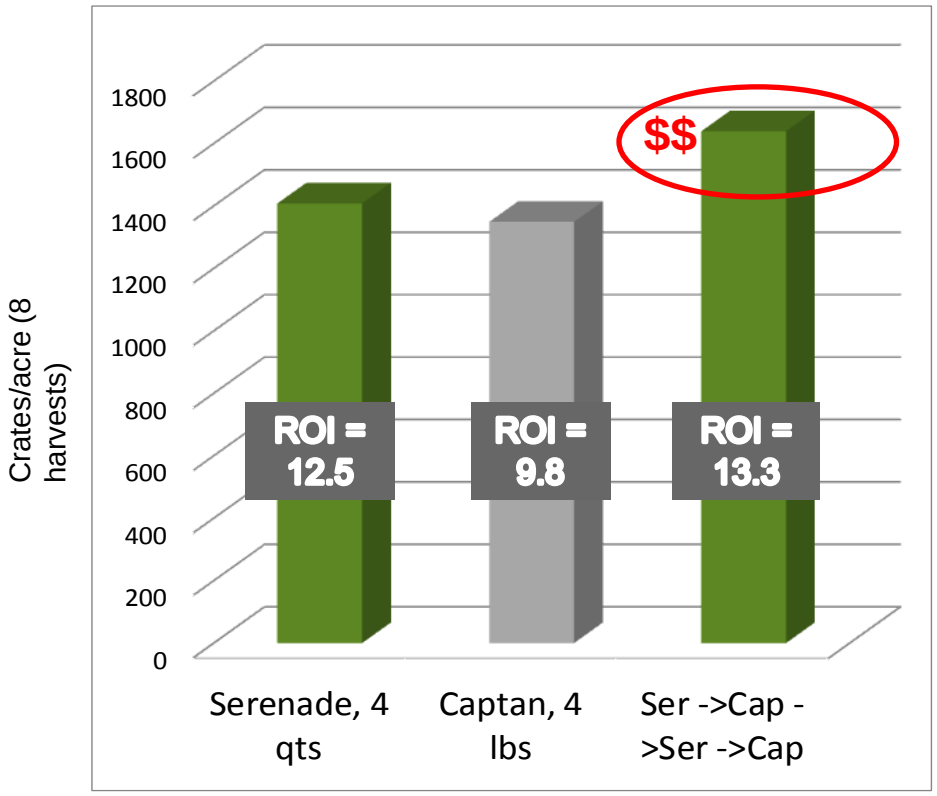
Managing MRLs

Programs with biologicals reduce residues *and improve grower profitability*

Residue Limits



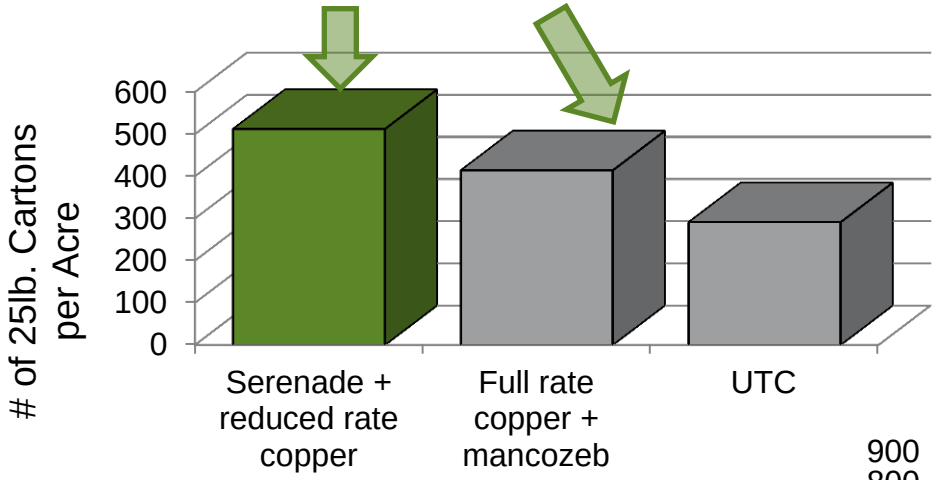
Highest yields and ROI



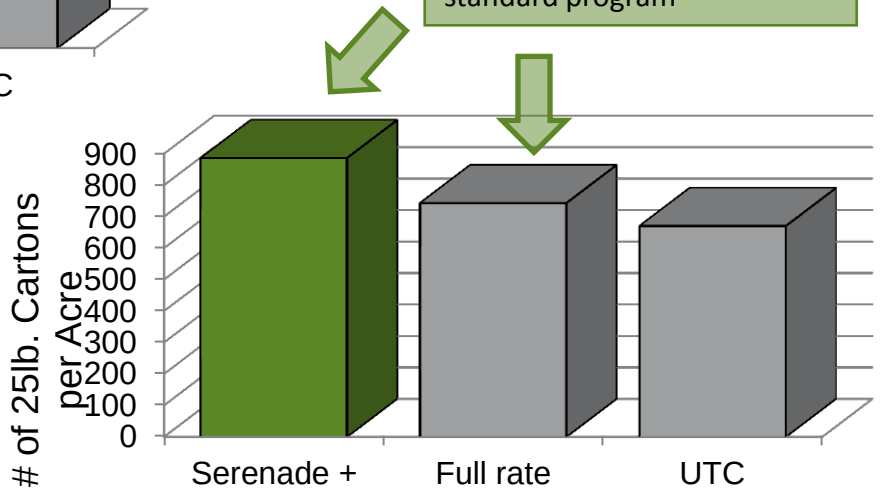
Increasing productivity of programs

Reducing applied copper improves sustainability profile AND increases return per acre, with no loss of disease control and no increase in per acre input costs

Total Extra Large Tomatoes: 221 boxes more than standard program



Total marketable tomatoes: 138 boxes more than standard program



+ $7800 more crop value per acre to the grower

Bayer CropScience summary

Fueling our Strategy for **Sustainable Success**

- We are aiming to lead the way in **Sustainable Crop Solutions**
- We aspire to **double the share of our Seeds** business **by 2016**
- We are **investing ~ €5 bn in R&D***
- We are **investing ~ €2 bn in CAPEX***
- Our new pipeline* has a combined **peak sales potential of >€4 bn**

*2011-2016

Thank You !