



# Keynote Agricultural Solutions

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# Cautionary note regarding forward-looking statements

*This presentation contains forward-looking statements. These statements are based on current estimates and projections of the Board of Executive Directors and currently available information. Forward-looking statements are not guarantees of the future developments and results outlined therein. These are dependent on a number of factors; they involve various risks and uncertainties; and they are based on assumptions that may not prove to be accurate. Such risk factors include those discussed in Opportunities and Risks on pages 123 to 130 of the BASF Report 2018. BASF does not assume any obligation to update the forward-looking statements contained in this presentation above and beyond the legal requirements.*



# Agenda

- 1** Market environment
- 2 Agricultural Solutions – focus area of BASF
- 3 The new BASF in agriculture in 2019
- 4 Target markets
- 5 Differentiators
- 6 Key measures
- 7 Targets

# The world in 2030

## Population growth

~9 billion people need food

## Growing middle class<sup>1</sup>

High demand for calories and protein rich diet

## Limitations in arable land

Arable land under pressure<sup>2</sup>, limited expansion possible

## Climate change

High volatility in crop production and farmer income



# The society in 2030

Increased  
urbanization

Acceptance of  
digital technologies;  
ag labor shortage

Demand  
for healthy,  
sustainable food

Consumers demand  
transparency and  
sustainability

Increasing  
regulatory  
requirements

Drive for  
innovative  
solutions

Trade  
conflicts

Increased trade  
frictions and local  
food demand



# The farm in 2030

50% higher  
productivity  
required

Drives growth  
in high-quality  
seeds and crop  
protection

Resistance  
to existing crop  
protection products

Strong demand for  
novel modes  
of action

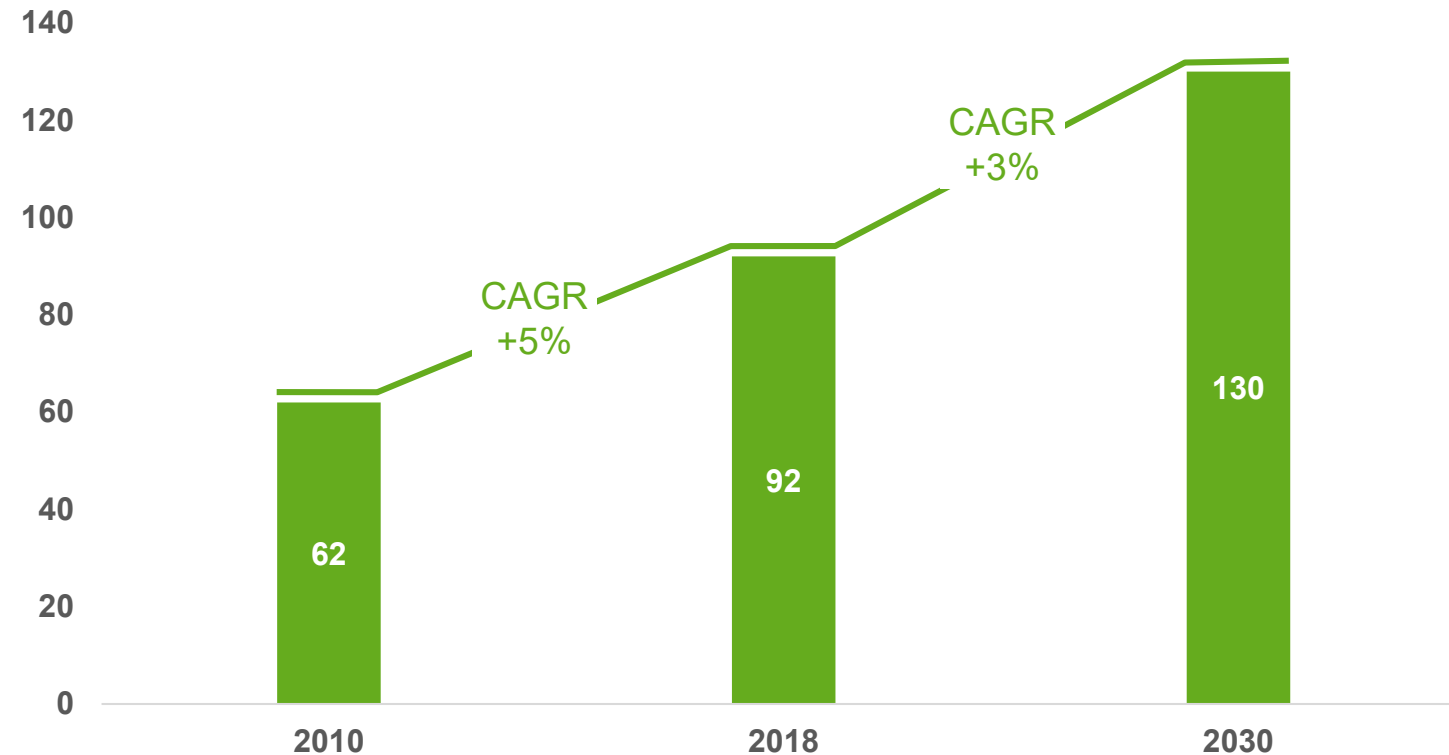
Increased farm  
professionalization

Strong focus on  
digitalization and  
farm management  
systems



# Agricultural solutions is an attractive market driven by increasing demand for food

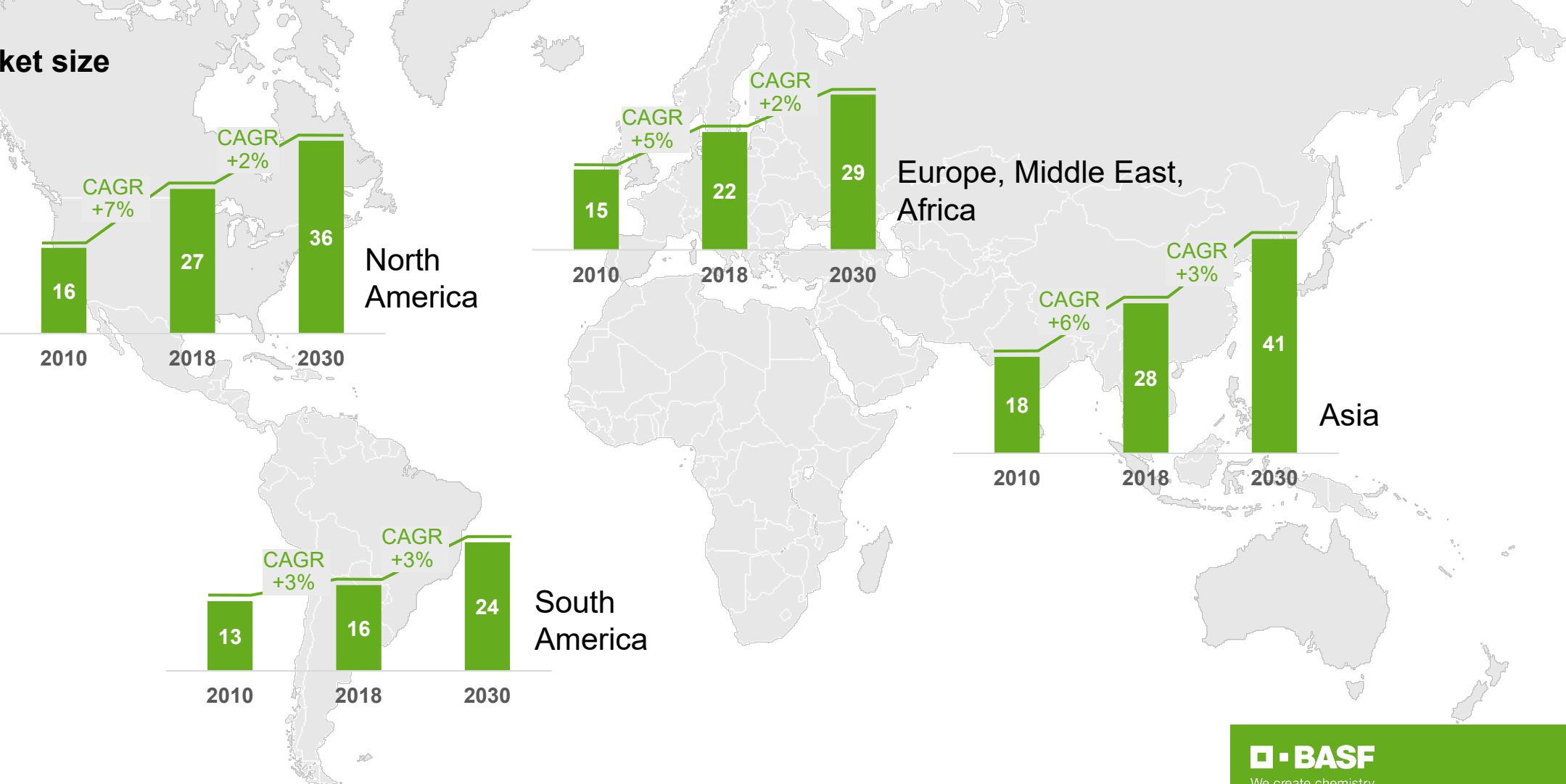
**Market size**  
billion €



- Crop protection and seeds continue to grow
- Main drivers are increasing yields and growing technology adoption
- Lower growth in crop protection products due to higher regulatory pressure and increasing application of precision farming tools
- Digital applications market grows rapidly, potentially reaching €10 billion by 2030
- Farmers will look to combine crop protection, seeds, digital and application technologies while fulfilling societal requirements

# All regions are of significant size and will contribute to market growth

**Regional market size**  
billion €





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# Agricultural Solutions is strongly contributing to BASF's purpose “We create chemistry for a sustainable future”

**~5%**

**Sales to 3<sup>rd</sup> parties**  
CAGR 2012 – 2018<sup>1</sup>  
(organic growth +3%)

**~23%**

**Average EBITDA**  
**margin before**  
**special items**  
2012 – 2018<sup>1</sup>

**~13%**

**Average return on**  
**capital employed**  
2012 – 2018<sup>1</sup>

**~€2.3 billion**

**Average annual sales**  
**with products on the**  
**market for less**  
**than 5 years**  
2012 – 2018

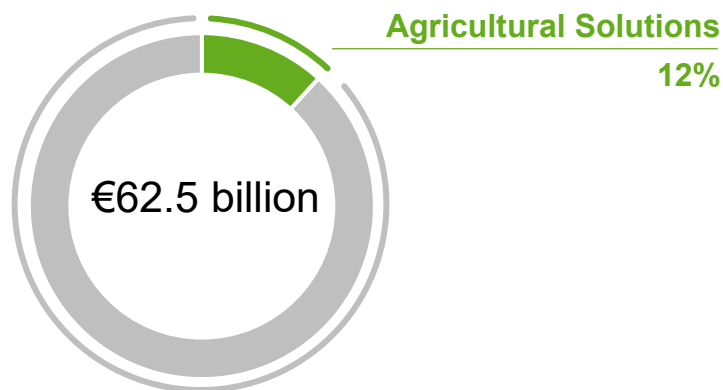
**€6 billion**

**Peak sales potential**  
**of innovation pipeline**  
2018 – 2028

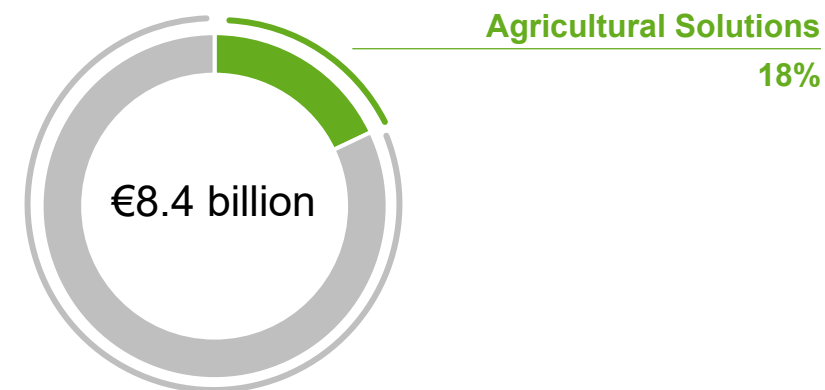


# Agricultural Solutions is a major earnings contributor to BASF Group

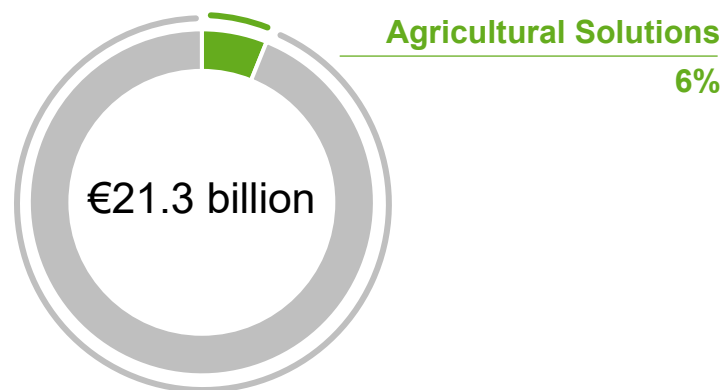
**Sales, last 12 months<sup>1</sup>**  
billion €



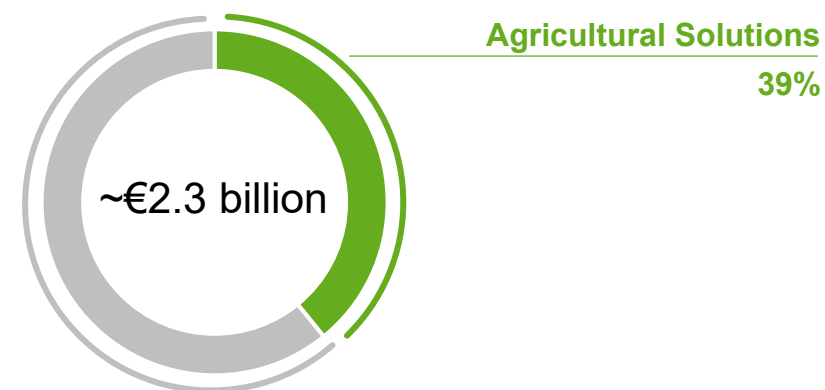
**EBITDA before special items, last 12 months<sup>1</sup>**  
billion €



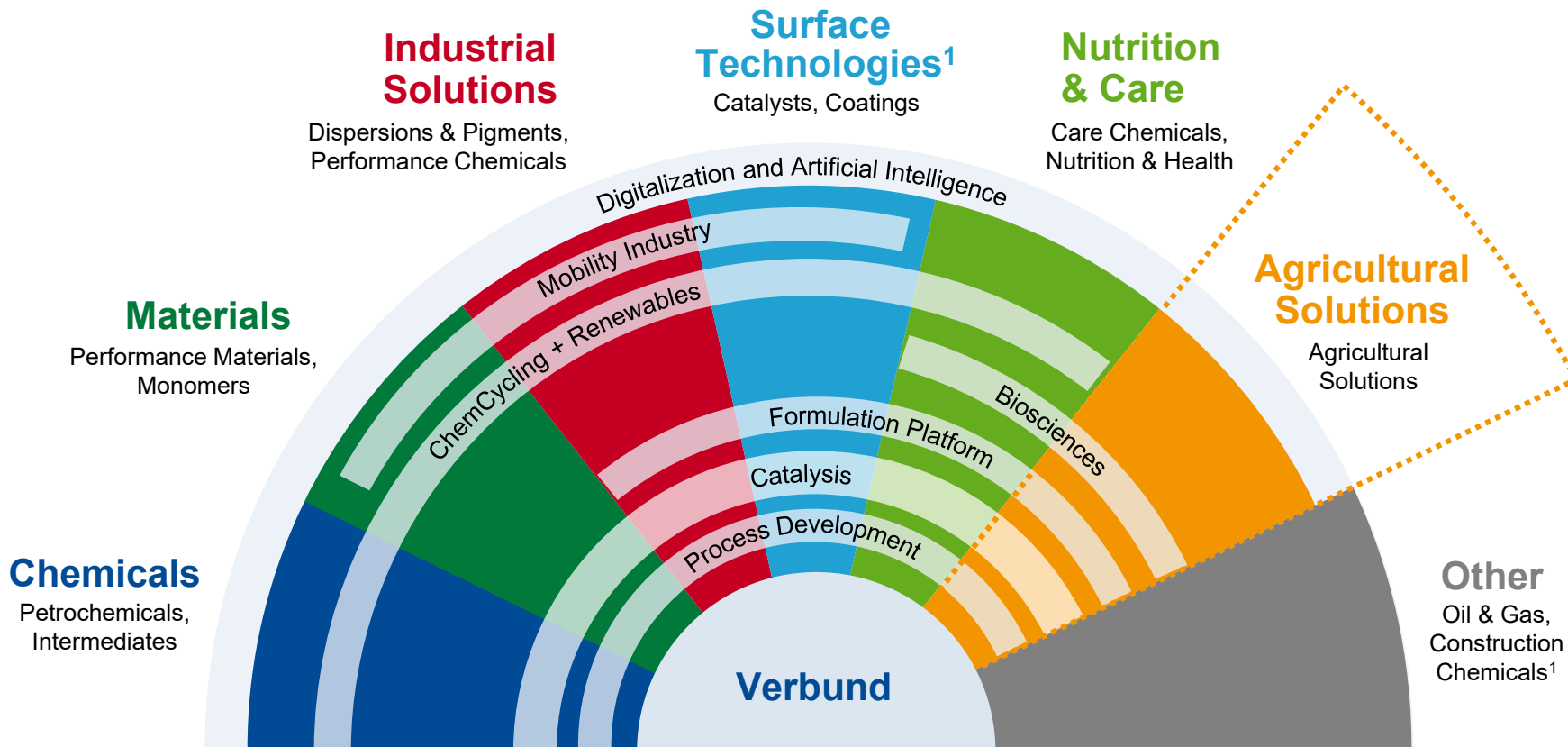
**Capex budget 2019–2023**



**Expected annual R&D expenditures**  
billion €



# Agricultural Solutions is a focus area of BASF and benefits from the integration into the production and know-how Verbund



- Agricultural Solutions sources ~25% of its raw materials, formulation components and catalysts from other BASF businesses
- Integrated biotechnology research platform
- Formulation know-how and development platform
- Synergies in digitalization



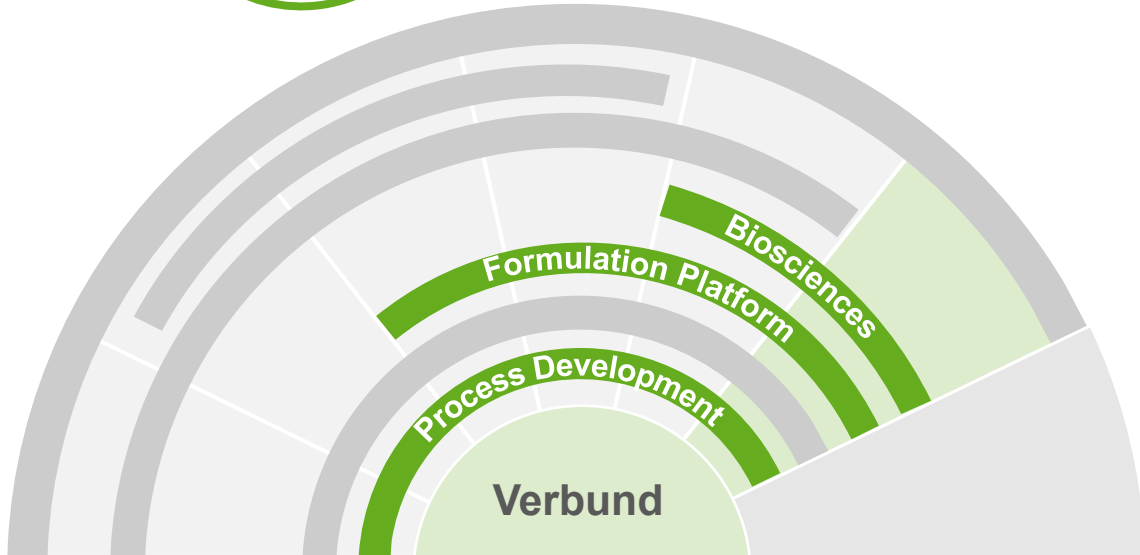
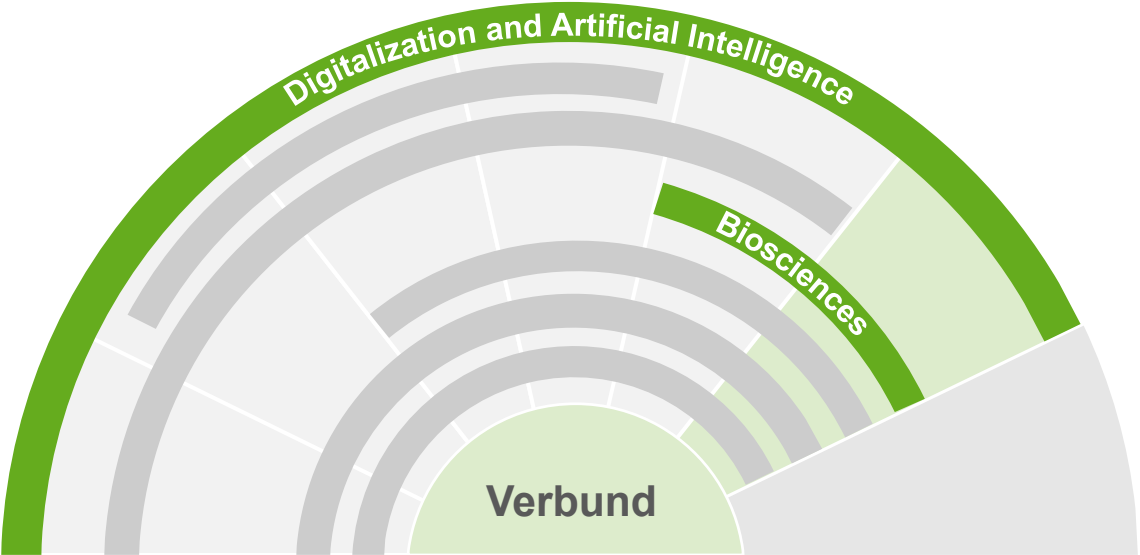
# BASF Verbund is key success factor to accelerate development, registration and launch of innovative crop protection products



**Revysol®**  
> €1 billion  
estimated peak sales potential



**Inscalis®**  
Low triple digit million euro  
estimated peak sales potential



# Providing innovative solutions that enable agricultural productivity, environmental protection and value to society

## Societal requirements

CO<sub>2</sub>-neutrality



Ability to cope with extreme weather events



Maintain and increase biodiversity



Foster trust in science



## Contribution of BASF Agricultural Solutions

- Optimized crop production and higher yield (lower inputs, higher outputs)
- High-yield and stress-tolerant crops
- Digital technologies for targeted applications
- Sustainability in practice
- Industry-leading sustainability criteria
- Increased transparency



# AgBalance™ – supporting farmers in measuring, demonstrating and improving their sustainability performance

- Holistic method for life-cycle assessment in agricultural and food value chain production processes
- Enables assessment of all three sustainability pillars (ecology, society and economy)
- Helps farmers make informed decisions to improve sustainability of farming practices
- AgBalance™ has been used to improve sustainable cultivation of crops such as oilseed rape/canola, corn, soybean, wheat and vegetables

Example:  
Application of urease inhibitor  
Limus® in wheat farming  
in Germany

- Greenhouse gas emissions -4%
- Acidification -40%
- Eutrophication -8%







Finding the **right balance**

for **success**

for **farmers, agriculture**  
and **future generations**



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# Structural integration of acquired businesses and assets successfully completed

Business continuity from **Day 1** onwards

Around **€2 billion** sales in 12 months after closing

More than **4,500** colleagues integrated

All **key personnel** joined BASF

**200** sites in **60** countries integrated

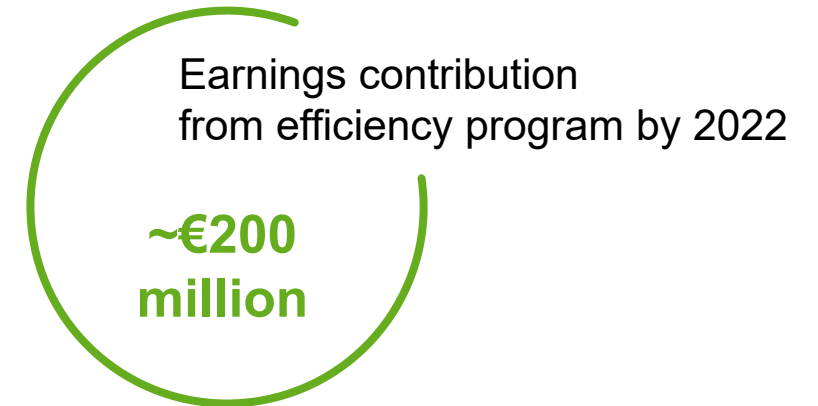
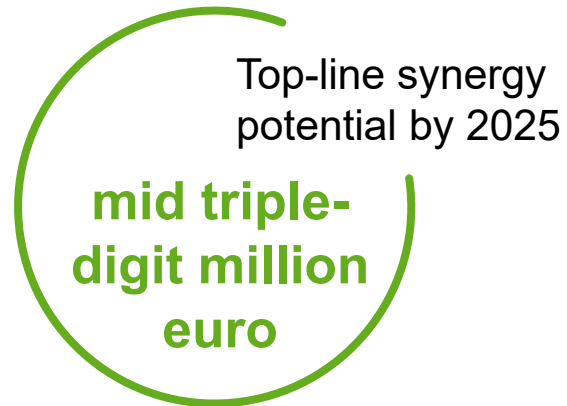
**Complementary portfolios** of products and services

Enhanced **R&D** pipeline, capabilities and scale

**ERP** system migration completed



# Following structural integration, the focus is now on realizing synergies and measures to further increase competitiveness



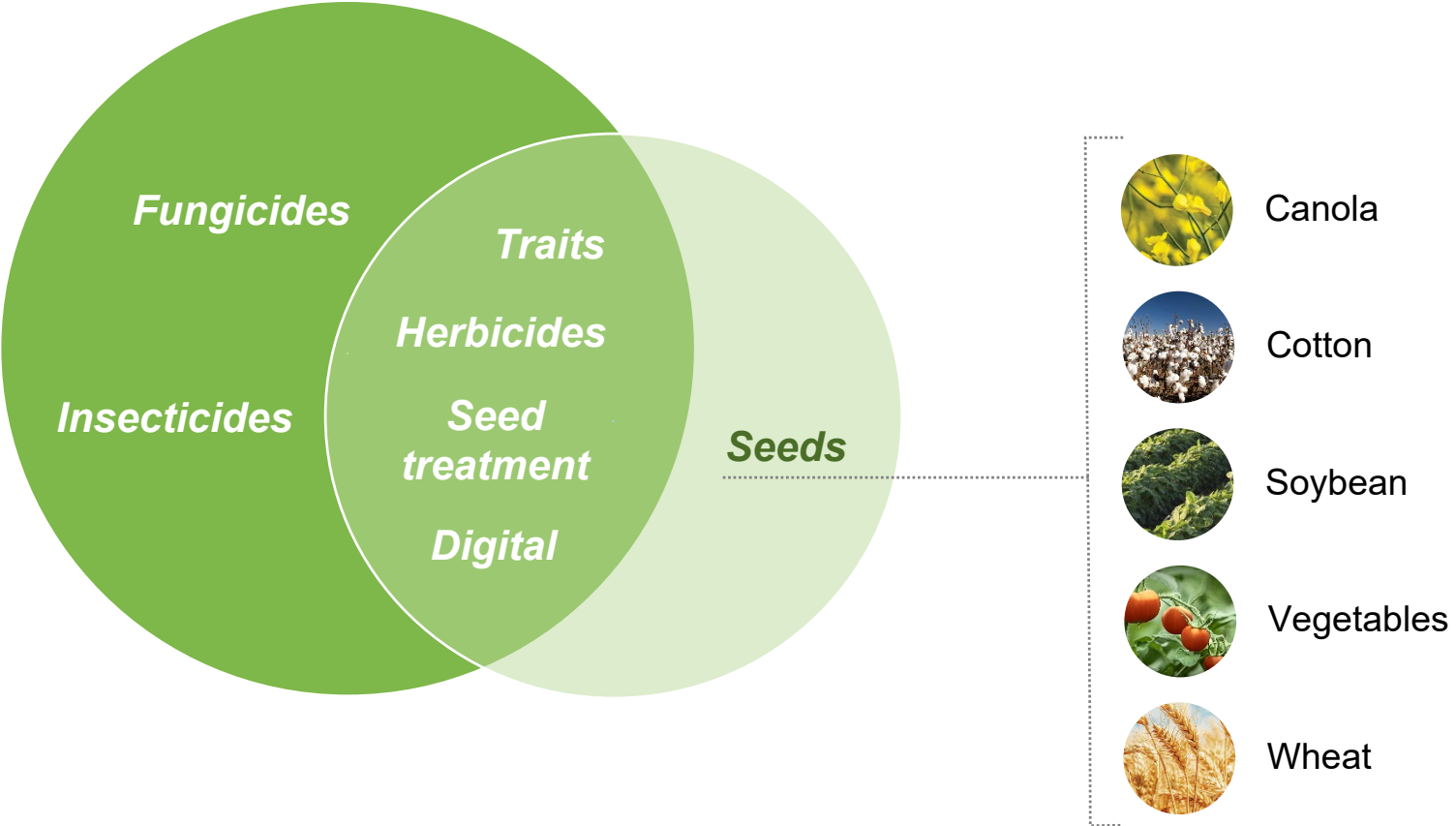
## Focus on realization of top-line synergies

- Significant contribution in North America expected from combining seeds and crop protection products
- Brazil is aiming for synergies from seeds business
- Asia and Europe to contribute to synergies through connected offers and new customers
- Realization of synergies in 2019 on track

## Measures to increase efficiency and commercial excellence

- More than 350 measures identified in the areas of commercial excellence, R&D and regulatory, inventory and capital expenditures, procurement and organizational efficiency
- Improving performance short-term, strengthening BASF in agriculture for long-term success

# BASF transformed from a crop protection company into a provider of agricultural solutions



### New competitive position

- Ability to provide connected offer of crop protection products, seeds and digital solutions in selected crops
- Global number 3 position in crop protection strengthened (e.g., in herbicides, seed treatment)
- Relevant number 4 position in seeds with leading position in canola and, in future, hybrid wheat





# Following the acquisition, BASF is fully enabled to offer innovative solutions with strong brands in all indications and sectors<sup>1</sup>

## Seeds & traits

-  Stoneville
-  FiberMax<sup>®</sup>  
cotton
-  Credenz
-  InVigor
-  nunhems
-  LibertyLink<sup>®</sup>
-  Clearfield<sup>®</sup>  
Production System
-  Provisia<sup>™</sup>  
Rice System

## Seed treatment

-  Standak<sup>®</sup> Top
-  ILEVO<sup>®</sup>  
Seed Treatment
-  Systiva<sup>®</sup>  
Seed Treatment
-  Nodulator<sup>®</sup> PRO
-  Poncho Votivo<sup>®</sup>  
Seed Treatment

## Crop protection

-  Revysol<sup>®</sup>
-  Kixor<sup>®</sup>
-  Basta<sup>®</sup>
-  Nealta<sup>®</sup>
-  Finale<sup>®</sup>
-  Liberty<sup>®</sup>
-  F500<sup>®</sup>
-  Xemium<sup>®</sup>
-  Inscalis<sup>®</sup>
-  Initium<sup>®</sup>
-  Engenia<sup>®</sup>

## Digital farming

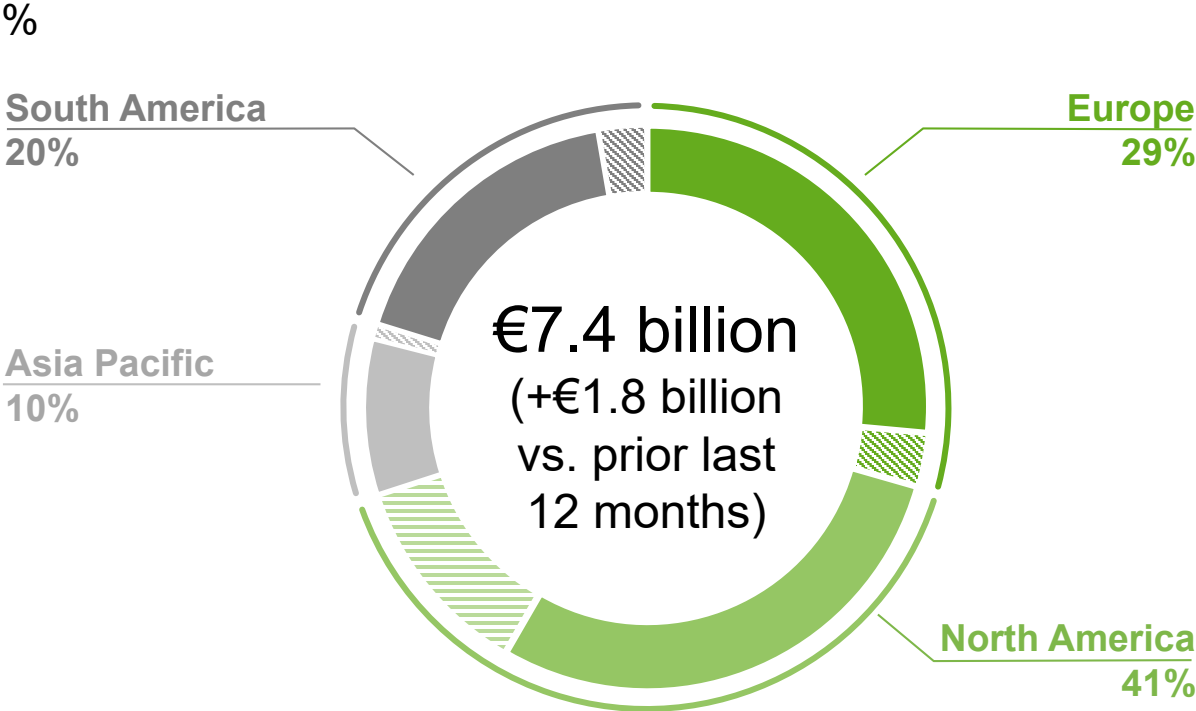
-  xarvio<sup>™</sup>  
SCOUTING
-  xarvio<sup>™</sup>  
FIELD MANAGER
-  xarvio<sup>™</sup>  
HEALTHY FIELDS

● Fungicides ● Herbicides ● Insecticides

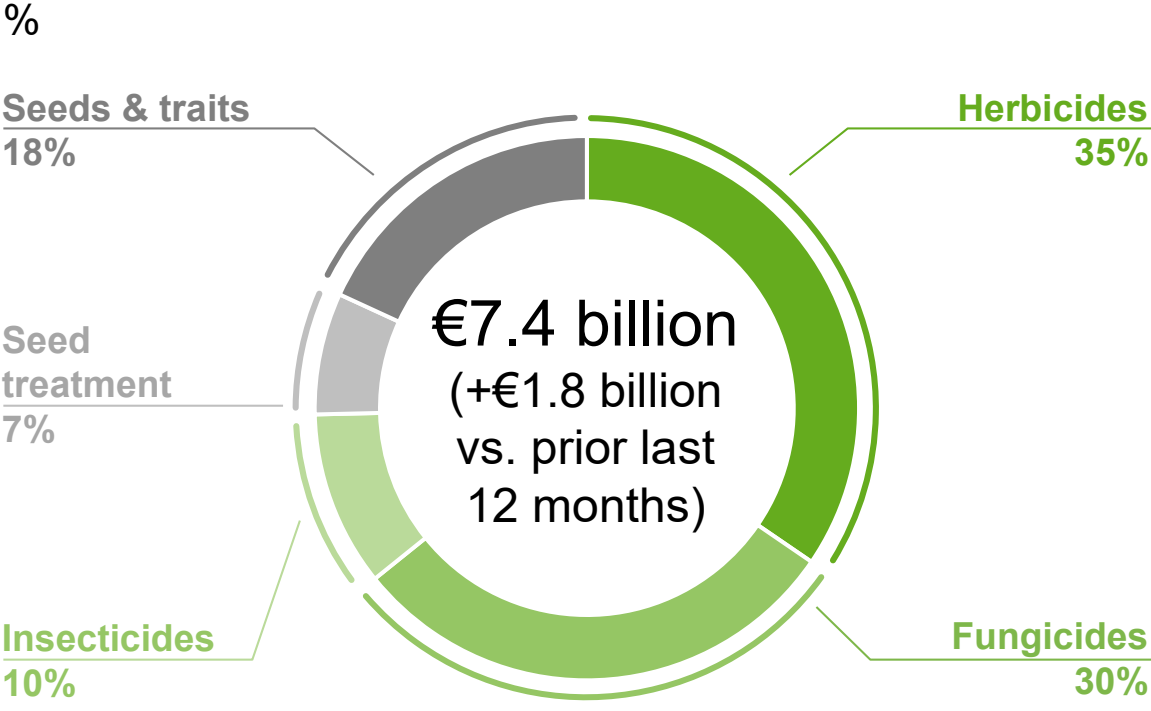


# Well-balanced portfolio with significant presence in all regions, indications and sectors

Sales by region, last 12 months<sup>1</sup>



Sales by indication and sector, last 12 months<sup>1</sup>



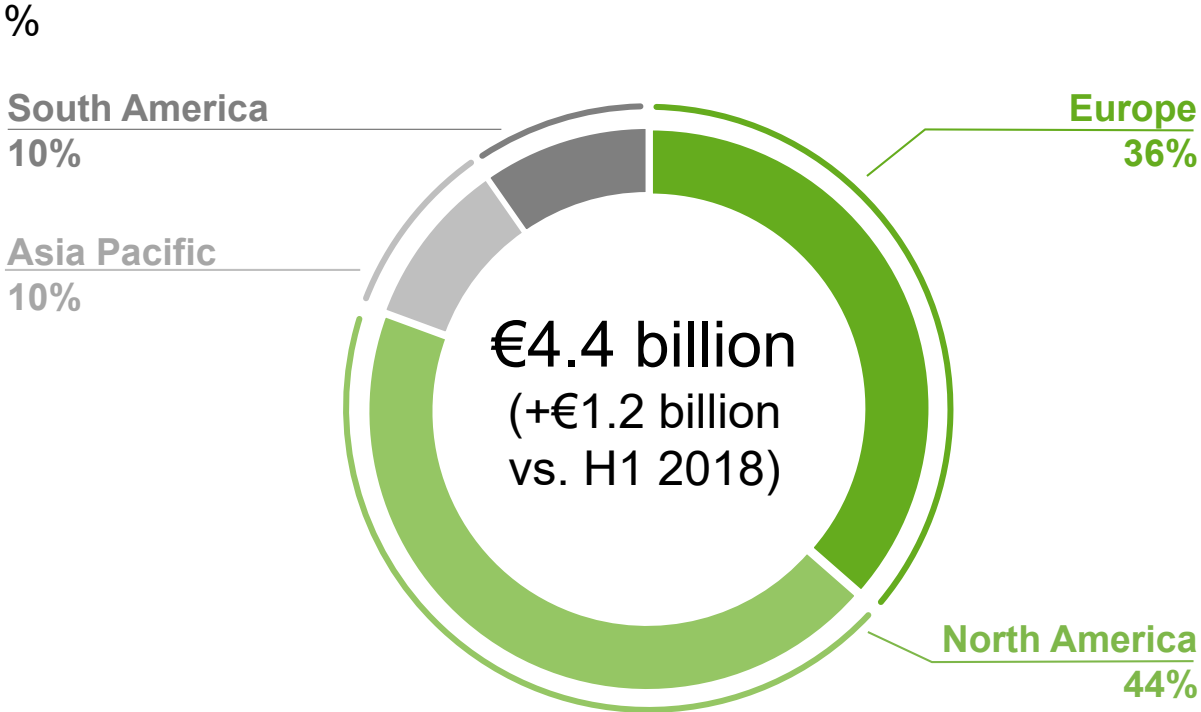
■ Crop protection  
 ■ Seeds & traits



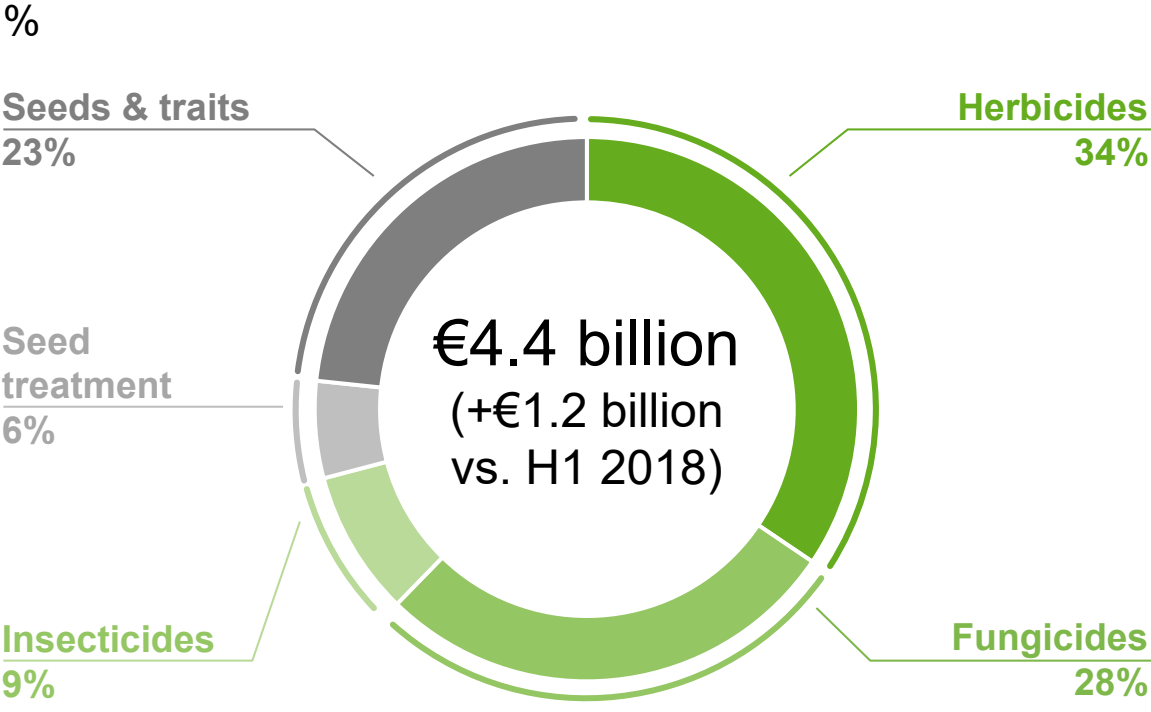


# Acquired seeds business with record sales in canola, cotton and vegetables in H1 2019

**Sales Agricultural Solutions by region, H1 2019**



**Sales by indication and sector, H1 2019**



# Legacy crop protection business impacted by adverse weather conditions and trade conflicts in H1 2019



## Challenging season in North America

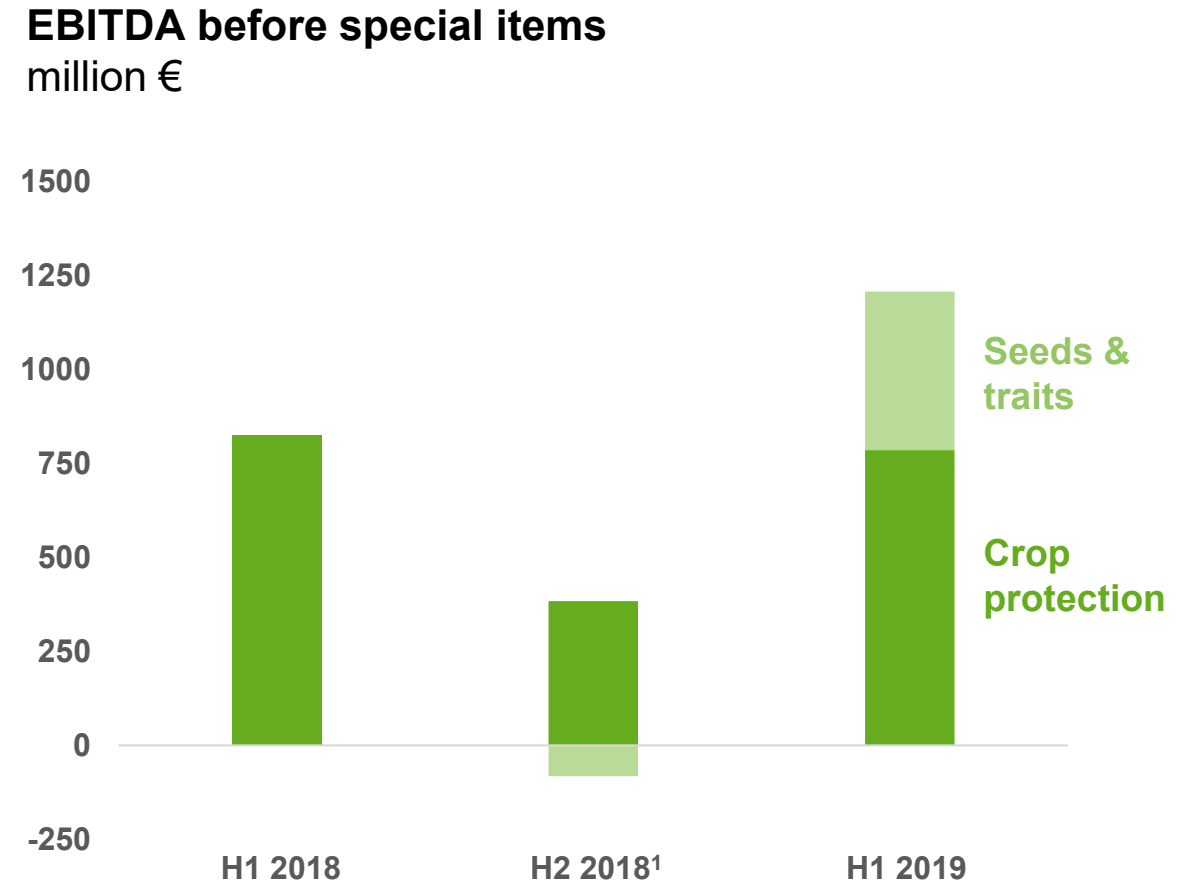
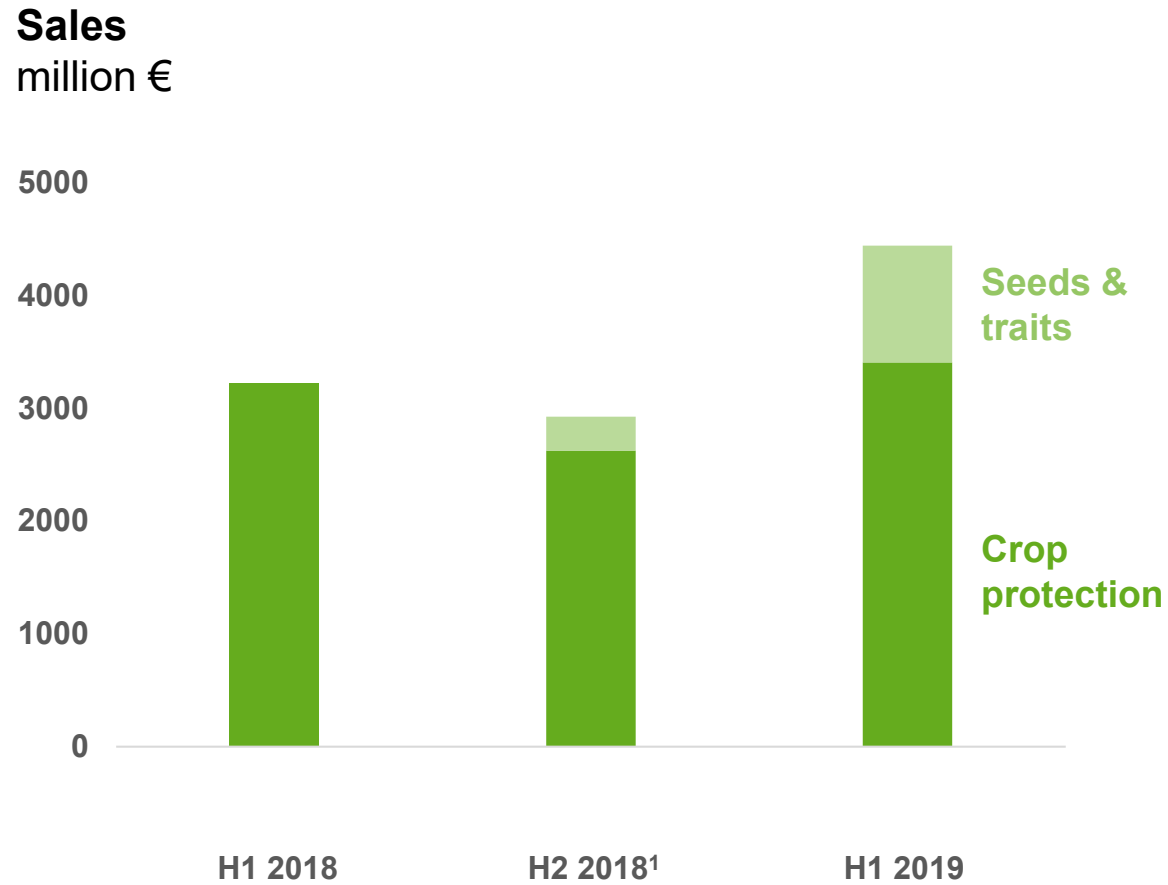
- Global trade conflicts impacted market development
- Severe drought in Canada burdened fungicides business
- Delayed planting and unfavorable crop conditions in the U.S. due to adverse weather conditions and flooding
- Negative mix effect due to weak demand for crop protection products and less soybean acres
- Substantial destocking by distributors; BASF managed to reduce channel inventories

## Good business development in South America

- Good start into the season 2019/2020 with low channel inventories
- Above-market growth expected, particularly in Brazil



# Strong profitability of Agricultural Solutions with distinct seasonality



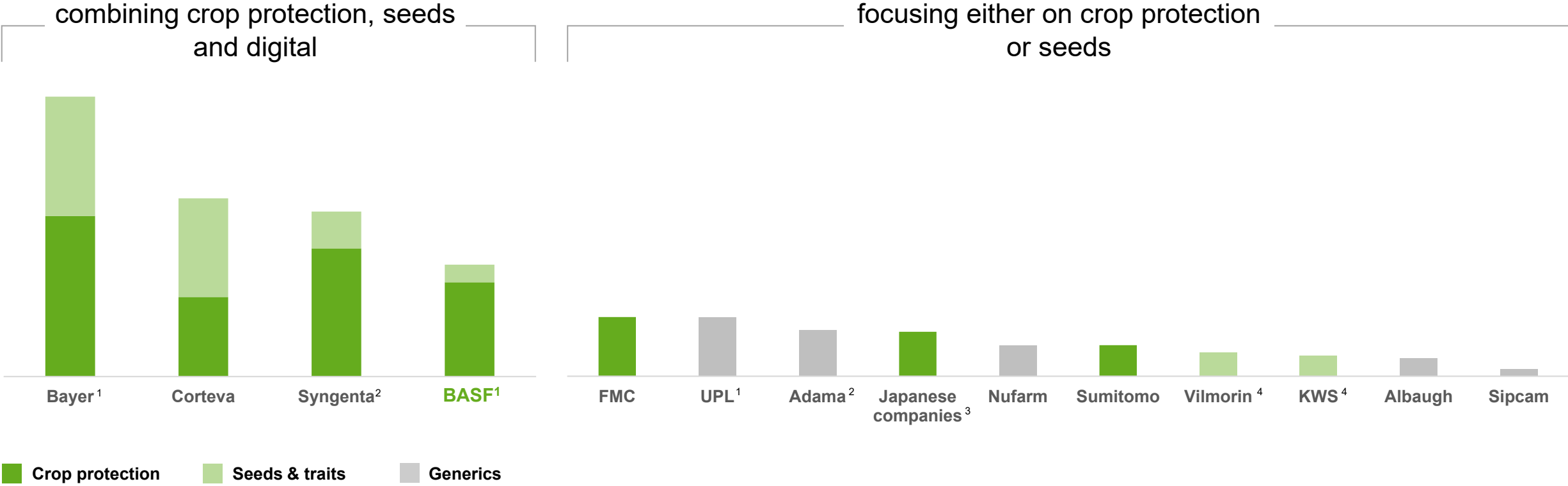
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# BASF is well positioned in the group of market-leading companies

## Competitive landscape, sales 2018



<sup>1</sup> Proforma sales; BASF Agricultural Solutions: legacy plus acquired business (FY) based on internal estimates <sup>2</sup> Part of ChemChina  
<sup>3</sup> R&D-driven Japanese companies within TOP 30 AgChem companies and sales <€1bn; <sup>4</sup> incl. 50/50 AgReliant Genetics JV split; Source: AgbiolInvestor 2018



# BASF Agricultural Solutions to strategically focus on four crop systems, covering ~70% of the total market



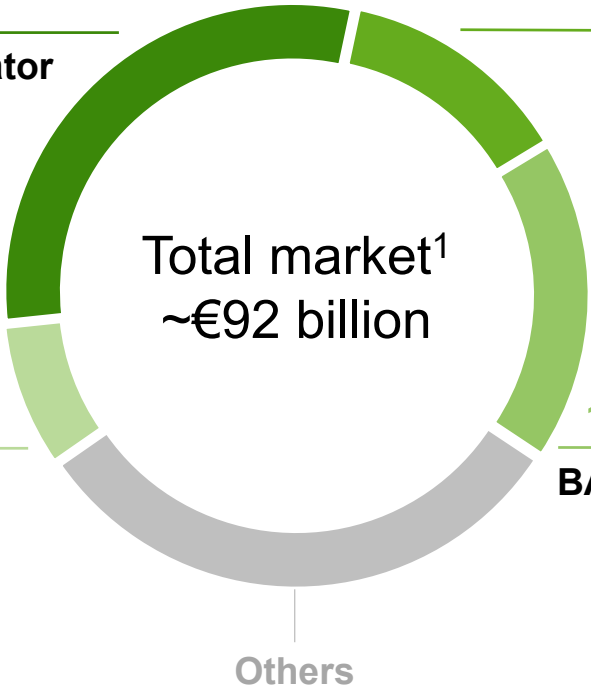
**Crop system**  
**soybean – cotton – corn**  
 in the Americas **30%**  
**BASF ambition: Strong innovator**

**Crop system**  
**wheat – canola – sunflower**  
 in Europe, North America **12%**  
**BASF ambition: Market leader**



**Crop system**  
**rice**  
 in Asia **8%**  
**BASF ambition: Recognized player in Asia**

**Crop system**  
**fruit and vegetables**  
 in all regions **18%**  
**BASF ambition: Global number 3**





# Farmers manage their land in an integrated approach to optimize yield, earnings and the use of natural resources

## Farmer benefits from growing different crops

- Maximize farm profitability
- Balance risks within a season, e.g., weather
- Optimize farm management and workload distribution
- Maintain soil quality season after season

## Crops are managed in a system to

- Minimize pest and weed pressure
- Increase yield with crop rotation
- Improve nitrogen and soil management
- Optimize equipment usage
- Address societal challenges, e.g., biodiversity



**crop systems**

BASF's **connected offers** across...

- Seeds
- Crop protection
- Digital
- Sustainability

... **integrated into the farmers' operations and practices driven by their crop system**

# Crop systems approach enables BASF to support farmers in selected crops and geographies



**soybean  
cotton  
corn**



**wheat  
canola  
sunflower**



**fruit and  
vegetables**



**rice**

## Key challenges for farmers

- Profitability and income volatility
- Pests, weeds, diseases resistant to existing technologies
- Secure farm profitability and efficient farm operations
- Address socio-political requirements, e.g., EU greening policy
- Higher quality standards from food value chain and consumers, e.g., low residues
- Capture crop value during seasonal price volatility
- Farm modernization and automation due to labor shortage or higher costs

## BASF contribution

- Differentiated traits in soybean and cotton
- New active ingredients in crop protection
- Best agronomic data-based digital recommendations
- R&D pipeline in crop protection and wheat traits
- Launch hybrid wheat
- Digital tools to address farmer needs
- Customer-consumer approach for food value chain orientation in seeds
- Superior digital tools addressing farmer and food value chain requirements
- Educate farmers about BASF's offerings
- Use sustainability to promote new, innovative crop protection technologies



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# BASF will differentiate versus peers with four strategic levers



Innovation



Digital



Sustainability



Customer experience



# BASF will differentiate versus peers with four strategic levers



Innovation



Digital



Sustainability



Customer experience

# Strong global R&D platform with locations in all key markets

**>30**  
projects in seeds  
& traits, crop  
protection and  
digital solutions

**~€900 million**  
annual  
Research &  
Development  
expenses

**>3,000**  
people in  
Research &  
Development

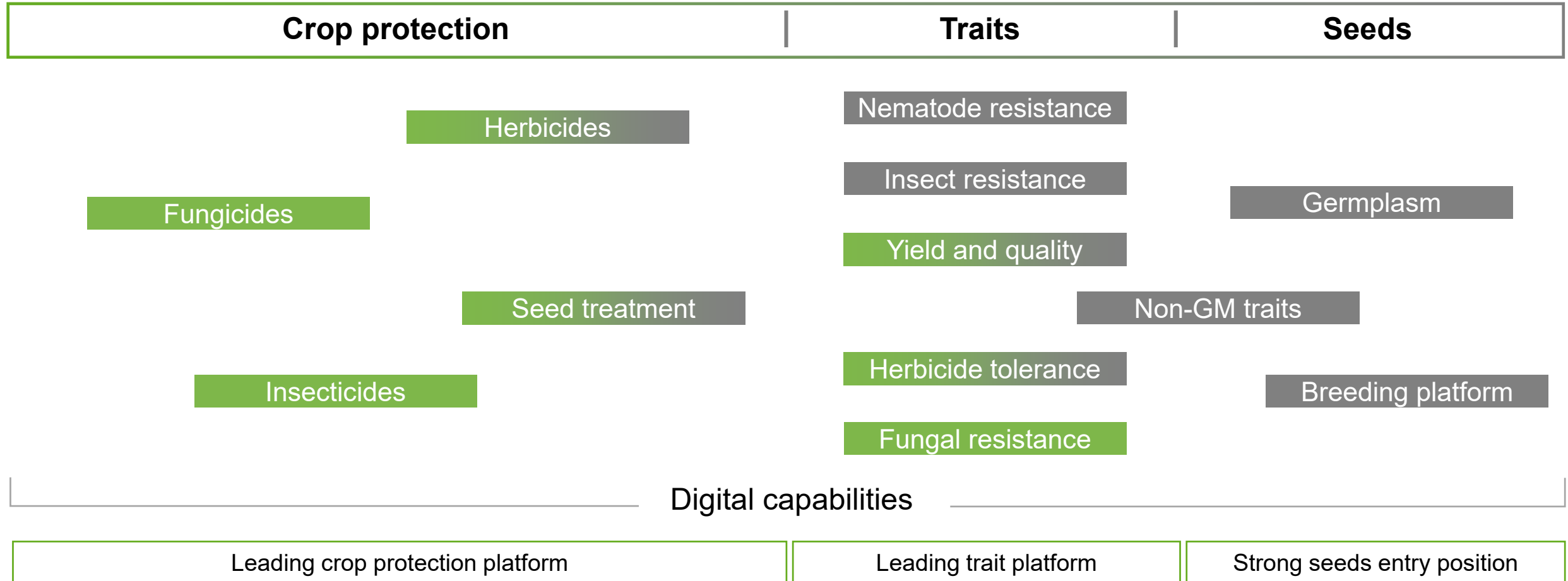
**4**  
Research &  
Development  
hubs

**26**  
Research &  
Development  
sites in all key  
markets

**>200**  
regional seed  
production and  
breeding facilities



# A comprehensive set of capabilities enables market-leading R&D platform

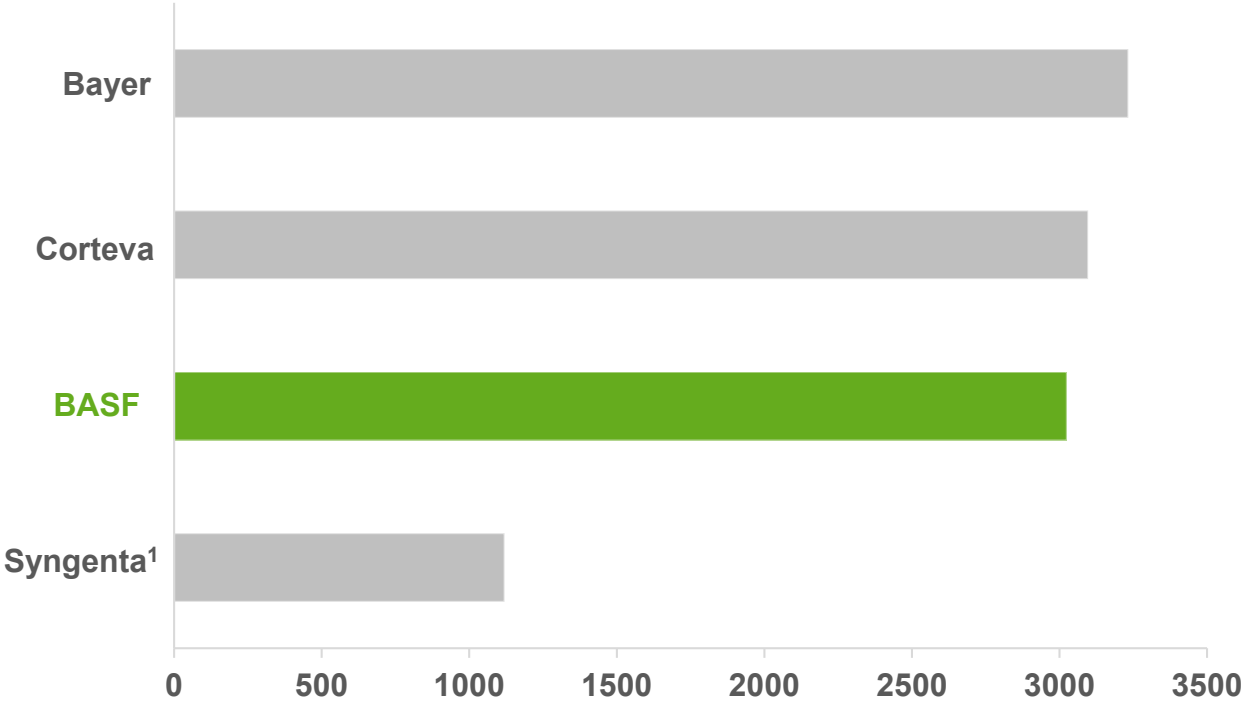


■ BASF legacy portfolio   ■ Acquired businesses and assets



# BASF has one of the strongest and most innovative traits portfolios

## Patent asset index™ traits



- Our strong traits pipeline complements our leading crop protection portfolio providing farmers with systems solutions for weed, pest and disease management
- Our trait portfolio is positioned to deliver innovative solutions for each crop system
- Differentiated and proprietary traits create value in own seed products and open up licensing opportunities



# BASF fosters an open innovation system with research institutes and partners from industry

Technologies and know-how



Market access



Canola – Omega-3 together with Cargill

Sustainable plant-based source of omega-3 fatty acids in canola



Corn & Soy – Yield & Stress together with Bayer



Short Stature Corn for plants with improved stability, greater flexibility of in-season crop inputs and nutrient use

More than 100 collaborations with academia and industry globally






# Strong pipeline with peak sales potential of >€6 billion<sup>1</sup> (1/2)

Crops	In launch	Development (2020 – 2025)	Advanced research (launch after 2025)	Early research
 <p>Soybean Cotton Corn</p>	<p>Engenia®</p> <p>Revysol®</p> <p>Inscalis®</p>	<p>Tirexor®</p> <p>Pavecto®</p> <p>Broflanilide</p> <p>Two in development</p> <p>Pavecto® seed treatment</p> <p>Teraxxa™</p>	<p>●</p> <p>●</p> <p>●</p>	<p>●</p> <p>●</p> <p>●</p>
	<p>LibertyLink®GT27™</p> <p>xarvio™ SCOUTING</p> <p>xarvio™ FIELD MANAGER</p>	<p>Herbicide tolerance trait</p> <p>xarvio™ SCOUTING</p> <p>xarvio™ FIELD MANAGER</p> <p>xarvio™ HEALTHY FIELDS</p>	<p>●</p>	<p>●</p>
 <p>Rice</p>	<p>Provisia™ herbicide</p> <p>Revysol®</p> <p>Inscalis®</p>	<p>Luximo®</p> <p>One in development</p>		<p>●</p> <p>●</p> <p>●</p>
	<p>Provisia™ rice trait system</p> <p>xarvio™ SCOUTING</p>	<p>xarvio™ SCOUTING</p> <p>xarvio™ FIELD MANAGER</p>		<p>●</p>

Herbicide   Fungicide   Insecticide   Seed treatment   Seeds & traits   Digital

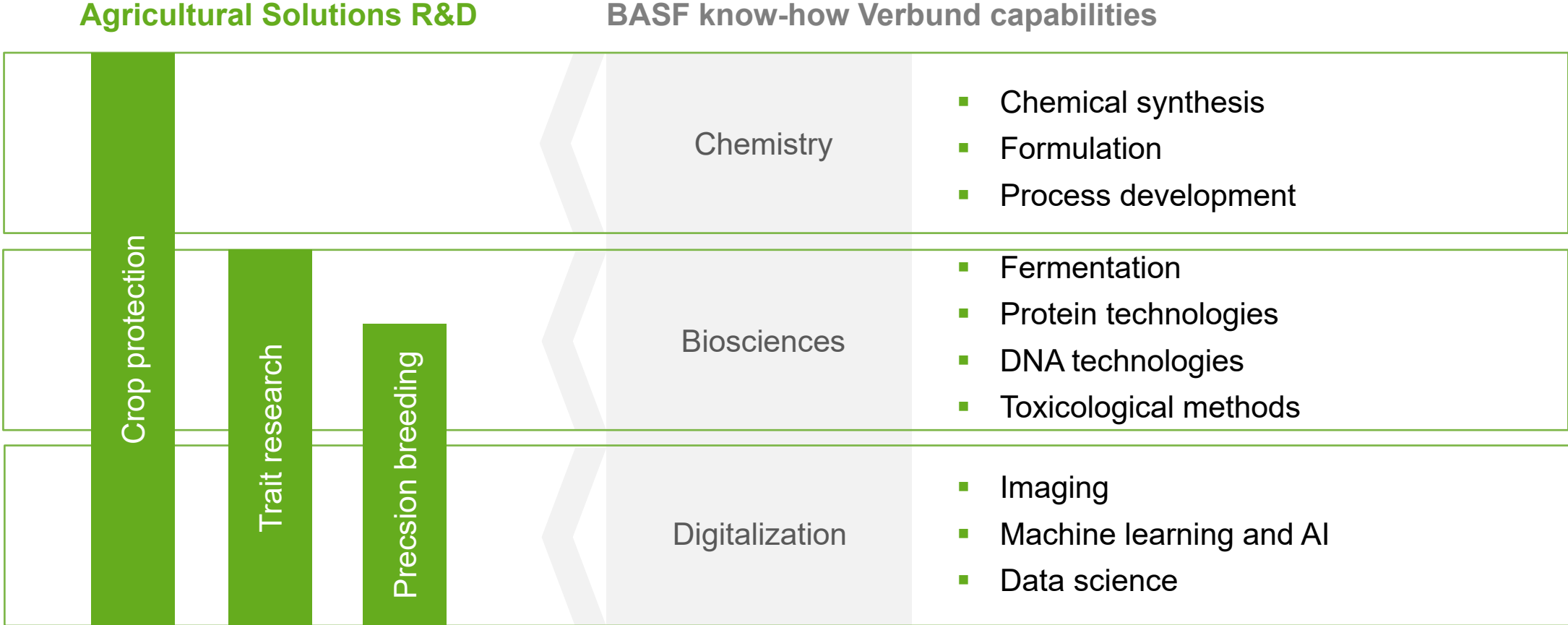
# Strong pipeline with peak sales potential of >€6 billion<sup>1</sup> (2/2)

Crops	In launch	Development (2020 – 2025)	Advanced research (launch after 2025)	Early research
 <p>Wheat Canola Sunflower</p>	Revysol®  Relenya™  InVigor® podshatter reduction InVigor® clubroot  xarvio™ SCOUTING xarvio™ FIELD MANAGER	Luximo®, Tirexor® Pavecto® Broflanilide One in development Pavecto® seed treatment Teraxxa™ Hybrid wheat LibertyLink® yellow canola PUFA xarvio™ SCOUTING xarvio™ FIELD MANAGER xarvio™ HEALTHY FIELDS	● ●	● ● ● ●
	Revysol® Inscalis®  Vegetable seeds innovations xarvio™ SCOUTING	Tirexor® Pavecto® Broflanilide; one in development Pavecto® seed treatment Teraxxa™ Vegetable seeds innovations xarvio™ SCOUTING xarvio™ FIELD MANAGER	● ● ●	● ● ● ●

Herbicide   Fungicide   Insecticide   Seed treatment   Seeds & traits   Digital



# Leveraging the BASF know-how Verbund gives a competitive advantage in Agricultural Solutions





# Crop protection innovations with societal and regulatory requirements in focus are powered by the BASF Verbund



> **€1 billion**  
estimated peak sales  
potential

## Revysol® fungicide

designed to meet the highest level of regulatory standards

The BASF Verbund advantage:

- De-risking through interdisciplinary approach of chemical, toxicological and regulatory sciences
- Proven expertise in computational modelling and machine learning to reduce off-target effects
- Parallel optimization of activity and minimization of unwanted secondary effects



**Low triple digit  
million euro**  
estimated peak sales  
potential

## Inscalis® insecticide

derived from fermentation with favorable environmental profile

The BASF Verbund advantage:

- Derived from a biotechnological approach through smart fermentation process development
- Innovative formulation technology drives efficacy
- Low use rates with minimal impact on beneficial arthropods and pollinators

# Blockbuster technologies give soybean growers new options

Weed management: new herbicides and herbicide tolerance  
Multiple new resistance-breaking herbicides linked with herbicide tolerance traits



Herbicide tolerance traits



Disease management: fungicides and fungal resistance  
New fungicide solutions paired with novel, robust multiple mode of action fungal resistance trait technology



Asian soybean rust trait

Pest management: nematicide seed treatment and nematode resistance  
Leading nematicide seed treatments with new, broadest, most reliable nematode control trait technology



Soybean cyst nematode resistance trait



# Hybrid wheat is an attractive blue ocean opportunity that benefits farmers and society



## Wheat market demand requires game changing innovation

- Hybridization in wheat to follow the success stories of other hybridized crops
- BASF holds a strong position with hybrid wheat varieties
- We are in for the “long-play” with significant future value from breeding first, followed by traits for improved performance



## Profitability

- Increase yield performance
- Higher return of investment



## Risk management

- Yield stability and consistency
- Durable resistance by pest and disease control traits



## Sustainability

- Increasing efficiency (water and nitrogen use)
- Drought and stress tolerance (climate change)
- Environmental benefits (less land use)



# BASF will differentiate versus peers with four strategic levers



Innovation



Digital



Sustainability



Customer experience

# Investments into digital products support growth in crop protection and seeds, new income streams will be established

## Smartening crop protection and seeds

- Digitally enabled product launches
- Stewardship (e.g., Engenia® tool)
- Digitally enabled sales force

## Enhanced digital market access

- Establish data relationships with growers and channel partners
- 1.2 million users today in >100 countries

## New digital business models

- xarvio™ SCOUTING
- xarvio™ FIELD MANAGER
- xarvio™ HEALTHY FIELDS (launch 2020)



# Combination of unique agronomic system with high-resolution plant protection allows for disruptive business models



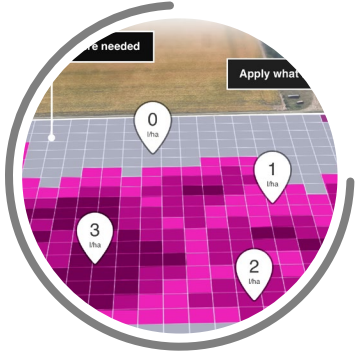
**xarvio™**  
HEALTHY FIELDS



**Farmer registration**

- Weed free<sup>1</sup>
- Disease free<sup>1</sup>
- Pest free<sup>1</sup>

**Solution purchase**



**xarvio™ decision making**



**Selection of contractor**



**Execution**

Disruptive outcome-based business models for farmers to be launched in 2020





# Building on channel partnerships to reach more farmers faster with xarvio™



BASF collaborates with Nutrien Ag Solutions™ to provide their customers with xarvio™ products



AgroStar – a leading Asian e-commerce provider for agricultural inputs – uses xarvio™ products to help small-holders understand what is happening on their fields

# BASF will differentiate versus peers with four strategic levers



Innovation



Digital



Sustainability



Customer experience

# Sustainable Solution Steering: Accelerator product examples in Agricultural Solutions



Revystar®  
Revysol®-based fungicide

Best foundation for farmer income and optimized farm management

- Satisfies the highest approval standards
- Essential tool for resistance management
- Outstanding biological performance



Vault® HP

Biological seed treatment system

- Improves root nodulation for more nitrogen-fixation potential
- Improved root architecture and nutrient uptake
- Greater plant vigor and optimized yield



Sharpen®

Burndown herbicide in key row crops

- Lower use rates
- Very effectively controlling resistant weeds
- Increased yield and resource efficiency



# Smart Stewardship: Digital farming technologies will contribute to sustainability in agriculture



Use of digital technologies for **targeted applications**



Ensure **good agricultural practices**



Consider **current environmental conditions**



Online documentation and **transparency of application**

## Example: Buffer zone tool

- Automatic mapping and consideration of no-spray buffer zones to sensitive areas (e.g., water bodies)
- Automated control of spraying equipment (e.g., avoiding vulnerable areas)
- Responsible application of crop protection products

# BASF will differentiate versus peers with four strategic levers



Innovation



Digital



Sustainability

Customer experience

# Customer feedback<sup>1</sup>: BASF is a reliable, approachable and consistent partner for farmers

R&D, technical expertise for high-quality products

Strong credibility as an innovator

High-quality people, willing to listen

Reliable, honest, trustworthy

Vision, experience, expertise for new products that work



<sup>1</sup> Source: Kynetec 2017 Global Measurement Qualitative – BASF in Agriculture Focus groups with 137 farmers and 58 farming advisors



# We want to strengthen customers' experience even further based on listening, dialog, respect and mutual trust



# Crop system example: Why Western Canadian canola and wheat farmers choose BASF

## High yields

- Top yielding seeds
- Competitiveness in the global grains market
- Quality and strict grading standards

## Seasonal challenges

- Safeguard yield
- Risk management
- Establish strong, healthy crop
- Control difficult/resistant diseases, weeds and pests
- Maintain crop quality

## BASF's connected offer to keep market leadership...

InVigor® hybrid canola  
Hybrid wheat (in future)

xarvio™ FIELD MANAGER  
xarvio™ SCOUTING



Heat® herbicide  
Tirexor® herbicide  
Nexicor® fungicide  
Caramba® fungicide  
Broflanilide insecticide

Heat® LQ  
CleanFARMS®  
Sustainability in Practice  
Pod Shatter  
Reduction technology

... integrated into the farmers' operations  
and practices driven by their crop system

## Wide range growing conditions

- Agronomic decision support
- Application optimization

## Shifting the way of farming

- Greater harvest flexibility, manage workload during busy harvest season
- Tighter rotations
- High-performing production practices
- Sustainability and environmental protection

# Agenda

- 1 Market environment
- 2 Agricultural Solutions – focus area of BASF
- 3 The new BASF in agriculture in 2019
- 4 Target markets
- 5 Differentiators
- 6 Key measures**
- 7 Targets



# Achievement of defined milestones will drive strong performance during the next decade

## Innovation

- Implement crop systems approach
- Launch eight crop protection active ingredients
- Launch new soybean trait platform
- Launch hybrid wheat (by mid 2020s)

## Digital

- Enable existing business with digital tools
- Establish data relationships with customers
- Introduce and grow outcome-based digital business models

## Sustainability

- Introduce Revysol®-based products with excellent sustainability profile
- Connect digital tools and crop protection to improve sustainability

## Customer

- Meet evolving customer needs based on continuous dialogue
- Provide winning offers based on results of systematic use of CRM and customer feedback tools

## Efficiency

- Mid triple-digit million euro sales synergies to be realized by 2025
- Efficiency program started in 2019, to contribute ~€200 million by 2022

### Key measures

# Major investments include R&D, production assets for new active ingredients, resources for digital offerings and acquisitions

	Annual expense (estimate)	Future	Drivers
R&D	<ul style="list-style-type: none"> <li>▪ €900 million</li> </ul>	<ul style="list-style-type: none"> <li>▪ Slight increase, depending on market conditions</li> </ul>	<ul style="list-style-type: none"> <li>▪ Innovation in crop protection</li> <li>▪ Innovation in seeds &amp; traits</li> </ul>
Capital expenditures	<ul style="list-style-type: none"> <li>▪ €260 million</li> </ul>	<ul style="list-style-type: none"> <li>▪ Increase, depending on market conditions</li> </ul>	<ul style="list-style-type: none"> <li>▪ In-house production of key active ingredients and intermediates</li> </ul>
Customer-facing digital offerings	<ul style="list-style-type: none"> <li>▪ €70 million</li> </ul>	<ul style="list-style-type: none"> <li>▪ Considerable increase (to ~2% of sales over time)</li> </ul>	<ul style="list-style-type: none"> <li>▪ New digital business models</li> <li>▪ Digitalization and automation</li> <li>▪ Digital tools to enable crop protection and seeds</li> </ul>
M&A relevance		<ul style="list-style-type: none"> <li>▪ Medium to high</li> </ul>	<ul style="list-style-type: none"> <li>▪ Seeds</li> <li>▪ Digital technologies</li> <li>▪ Individual active ingredients</li> </ul>

# BASF Agricultural Solutions is an attractive partner and will leverage its position to accelerate growth and strengthen profitability



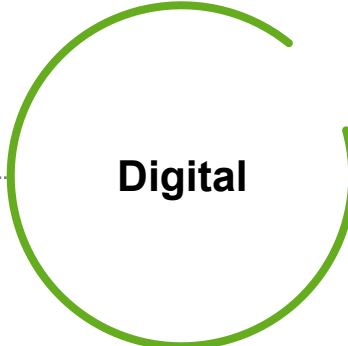
- Enhance soybean seeds portfolio, germplasm and traits
- Example Pavecto®
  - ▶ Joint development framework with Sumitomo
  - ▶ Development of novel fungicide



- Improve customer access and market footprint
- Increase footprint with selected partners in Asia
- Example sunflower seeds
  - ▶ Distribution agreement with Euralis Semences



- Expand ecosystem to increase value capture
- Example xarvio™
  - ▶ HEALTHY FIELDS



- Enhance technologies and features
- Strengthen customer and data access
- Example xarvio™
  - ▶ Scouting application as part of Nutrien Ag Solutions™ digital platform



# Agenda

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# Agricultural Solutions contributes strongly to achieving BASF Group's targets

## BASF targets

Grow sales volumes faster than global chemical production every year

Increase EBITDA before special items by 3% to 5% per year

Achieve a return on capital employed (ROCE) considerably above the cost of capital percentage every year

Achieve €22 billion in Accelerator sales by 2025

Grow CO<sub>2</sub>-neutrally until 2030

## Contribution of Agricultural Solutions

- Grow one percentage point above market to increase market share
- Increase sales by 50% by 2030
- Grow EBITDA before special items by on average 5% per year
- Restore EBITDA before special items margin level of ~23% within next years with high R&D intensity
- ROCE currently impacted by asset step up after acquisition
- Restore ROCE above the cost of capital percentage
- R&D pipeline with peak sales potential of >€6 billion<sup>1</sup>
- Accelerators account for approximately half of the R&D pipeline
- CO<sub>2</sub>-optimized production processes
- Offer solutions to reduce CO<sub>2</sub>-emissions in agricultural production



# BASF Agricultural Solutions – Success for farmers, agriculture and future generations

Unique customer experience based on crop systems approach

Best-in-class R&D pipeline

Sustainability as a key differentiator

Major contributor to BASF Group's profitable growth





We create chemistry



## Appendix

# Overview crop system soybean – cotton – corn



soybean – cotton – corn farmers

## Key characteristics

### Market size

- ~€27 billion<sup>1</sup>

### Key regions

- North America
- South America

### Expected market growth 2018-2030

- CAGR ~2.5%<sup>1</sup>

### Growth drivers

- Increasing global demand for meat-based protein diet
- Significant productivity increase with limited agricultural land expansion

### Key challenges for farmers

- Profitability and income volatility
- Pests, weeds, diseases resistant to existing technologies

### BASF ambition

- Strong innovator

### Key measures

- Differentiated traits in soybean and cotton
- New active ingredients in crop protection
- Best agronomic data-based digital recommendations



# R&D pipeline: crop system soybean – cotton – corn



Activity	Herbicide	Fungicide	Insecticide	Seed Treatment	Seeds & Traits	Digital
In launch	Engenia®	Revysol®	Inscalis®		LibertyLink®GT27™	<ul style="list-style-type: none"> <li>xarvio™ SCOUTING</li> <li>xarvio™ FIELD MANAGER</li> </ul>
Development (2020 – 2025)	Tirexor®	Pavecto®	<ul style="list-style-type: none"> <li>Broflanilide</li> <li>Two in development</li> </ul>	<ul style="list-style-type: none"> <li>Pavecto® seed treatment</li> <li>Teraxxa™</li> </ul>	Herbicide tolerance trait	<ul style="list-style-type: none"> <li>xarvio™ SCOUTING</li> <li>xarvio™ FIELD MANAGER</li> <li>xarvio™ HEALTHY FIELDS</li> </ul>
Advanced research (launch after 2025)	●	●	●		●	
Early research	●	●	●	●	●	

# Overview crop system wheat – canola/oilseed rape – sunflower



wheat – canola/oilseed rape – sunflower farmers

## Key characteristics

- Market size**
  - ~€12 billion<sup>1</sup>
- Key regions**
  - Europe
  - North America
- Expected market growth 2018-2030**
  - CAGR 2.0%<sup>1</sup>
- Growth drivers**
  - Increasing demand for yield and quality
  - Need for innovation driven by regulatory pressure on existing technologies

## Key challenges for farmers

- Secure farm profitability and efficient farm operations
- Address socio-political requirements, e.g., EU greening policy

## BASF ambition

- Market leader

## Key measures

- R&D pipeline in crop protection and wheat traits
- Launch hybrid wheat
- Digital tools to address farmer needs
- Actively shape sustainability in agriculture

# R&D pipeline: crop system wheat – canola/oilseed rape – sunflower



Activity	Herbicide	Fungicide	Insecticide	Seed Treatment	Seeds & Traits	Digital
In launch		Revysol®		Relenya™	<ul style="list-style-type: none"> <li>InVigor® podshatter reduction</li> <li>InVigor® clubroot</li> </ul>	<ul style="list-style-type: none"> <li>xarvio™ SCOUTING</li> <li>xarvio™ FIELD MANAGER</li> </ul>
Development (2020 – 2025)	<ul style="list-style-type: none"> <li>Luximo®</li> <li>Tirexor®</li> </ul>	Pavecto®	<ul style="list-style-type: none"> <li>Broflanilide</li> <li>One in development</li> </ul>	<ul style="list-style-type: none"> <li>Pavecto® seed treatment</li> <li>Teraxxa™</li> </ul>	<ul style="list-style-type: none"> <li>Hybrid wheat</li> <li>LibertyLink® yellow canola</li> <li>PUFA</li> </ul>	<ul style="list-style-type: none"> <li>xarvio™ SCOUTING</li> <li>xarvio™ FIELD MANAGER</li> <li>xarvio™ HEALTHY FIELDS</li> </ul>
Advanced research (launch after 2025)	●	●				
Early research	●	●	●	●	●	



# Overview crop system fruit and vegetables



fruit and vegetables farmers

## Key characteristics

Market size	<ul style="list-style-type: none"> <li>~€16 billion<sup>1</sup></li> </ul>
Key regions	<ul style="list-style-type: none"> <li>Asia</li> <li>North America</li> <li>Europe</li> <li>South America</li> </ul>
Expected market growth 2018-2030	<ul style="list-style-type: none"> <li>CAGR 2%<sup>1</sup></li> </ul>
Growth drivers	<ul style="list-style-type: none"> <li>Increasing demand for high-quality fruit and vegetables all year long</li> <li>Strong professionalization of production</li> </ul>

## Key challenges for farmers

- Higher quality standards from food value chain and consumers, e.g., traceability, low residues
- Capture crop value during seasonal price volatility

## BASF ambition

- Global number 3

## Key measures

- Customer-consumer approach for food value chain orientation in seeds
- Superior digital tools addressing farmer and food value chain requirements, e.g., residue minimization

# R&D pipeline: crop system fruit and vegetables



Activity	Herbicide	Fungicide	Insecticide	Seed Treatment	Seeds & Traits	Digital
In launch		Revysol®	Inscalis®		Vegetable seeds innovations	xarvio™ SCOUTING
Development (2020 – 2025)	Tirexor®	Pavecto®	<ul style="list-style-type: none"> <li>▪ Broflanilide</li> <li>▪ One in development</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pavecto® seed treatment</li> <li>▪ Teraxxa™</li> </ul>	Vegetable seeds innovations	<ul style="list-style-type: none"> <li>▪ xarvio™ SCOUTING</li> <li>▪ xarvio™ FIELD MANAGER</li> </ul>
Advanced research (launch after 2025)	●	●	●			
Early research	●	●	●	●	●	

# Overview crop system rice



rice farmers

## Key characteristics

### Market size

- ~€7 billion<sup>1</sup>

### Key region

- Asia

### Expected market growth 2018-2030

- CAGR 3%<sup>1</sup>

### Growth drivers

- Increasing demand for yield
- Adoption of modern and sustainable technologies (e.g., drone application)

### Key challenges for farmers

- Farm modernization and automation due to labor shortage or higher costs

### BASF ambition

- Recognized player in Asia

### Key measures

- Educate farmers about BASF's offerings
- Use sustainability to promote new, innovative crop protection technologies
- Multichannel approach



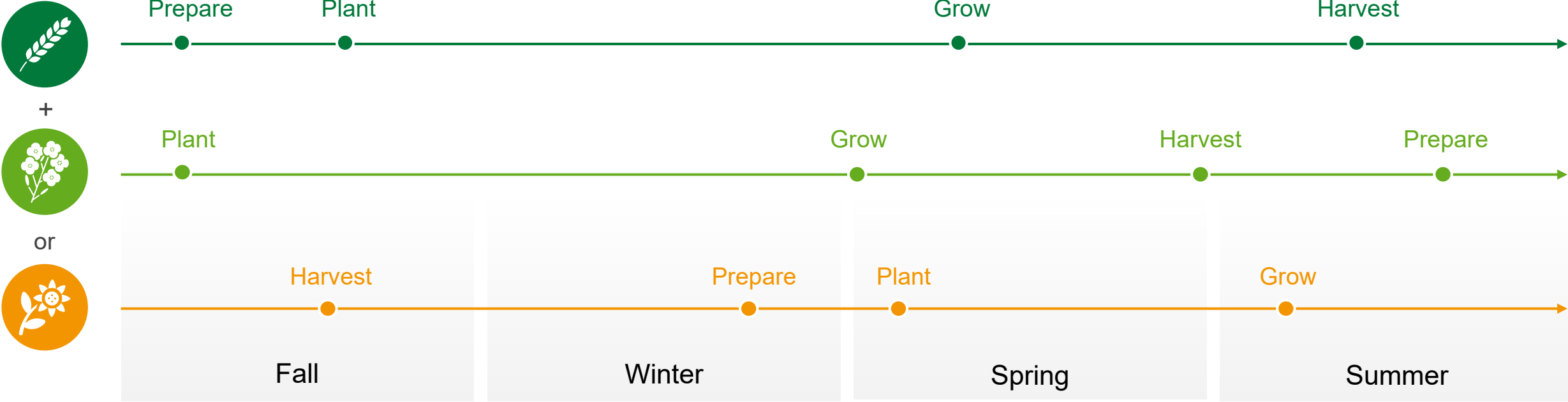
# R&D pipeline: crop system rice



Activity	Herbicide	Fungicide	Insecticide	Seed Treatment	Seeds & Traits	Digital
In launch	Provisia™ herbicide	Revysol®	Inscalis®		Provisia™ rice trait system	xarvio™ SCOUTING
Development (2020 – 2025)	Luximo®		One in development			<ul style="list-style-type: none"> <li>xarvio™ SCOUTING</li> <li>xarvio™ FIELD MANAGER</li> </ul>
Advanced research (launch after 2025)						
Early research	●	●	●	●	●	

# Seasonal patterns are the basis for crop systems

## Example: Wheat – canola / wheat – sunflower crop system



Crop systems enable long-term yield

- **Optimize:** deployment and availability of labor and machinery
- **Minimize risks:** climate, weed/pest pressure, price fluctuations
- **Maximize:** yields and profits in the combination of all crops