



# The Changing Face of Crop Protection

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# The challenge



# Global challenges for food demand and production

Need to produce significantly more while protecting natural resources



- Projected 10 billion world population
- Limited arable land
- 60% increase in food demand
- Impact of climate change
- Depletion of ground water
- Poor soil health
- Lack of available labor
- Loss of produce along the food chain
- Changing consumption preferences



Source: UN Intergovernmental Panel on Climate Change, 2014.

Agriculture certainly has it's critics...



Tips to Be Fit: Avoiding pesticides in fruit and vegetables

**Monsanto ordered to pay \$289 million in world's first Roundup cancer trial**

**Bees 'get a buzz' from pesticides**

By Helen Briggs  
BBC Environment Correspondent

**EU has 'no plans' to revise its strict regulations on gene-edited crops, European Commission official says**

Commercial pesticides: Not as safe as they seem



# Despite modern agriculture's importance...



**75%** worry about our **water supply**

**73%** are concerned with **pesticides** in their food

**58%** are concerned about **GMOs**

**91%** that ensuring access to safe, affordable and nutritious food for everyone is thought to be the **most critical** food issue to address

While consumers generally believe that agricultural advancements are necessary – only **35%** believe them to be safe



Source: Bayer® Consumer Study, USA, 2017

# Societal viewpoints will drive additional challenges

Trust and transparency necessary to address consumer concerns



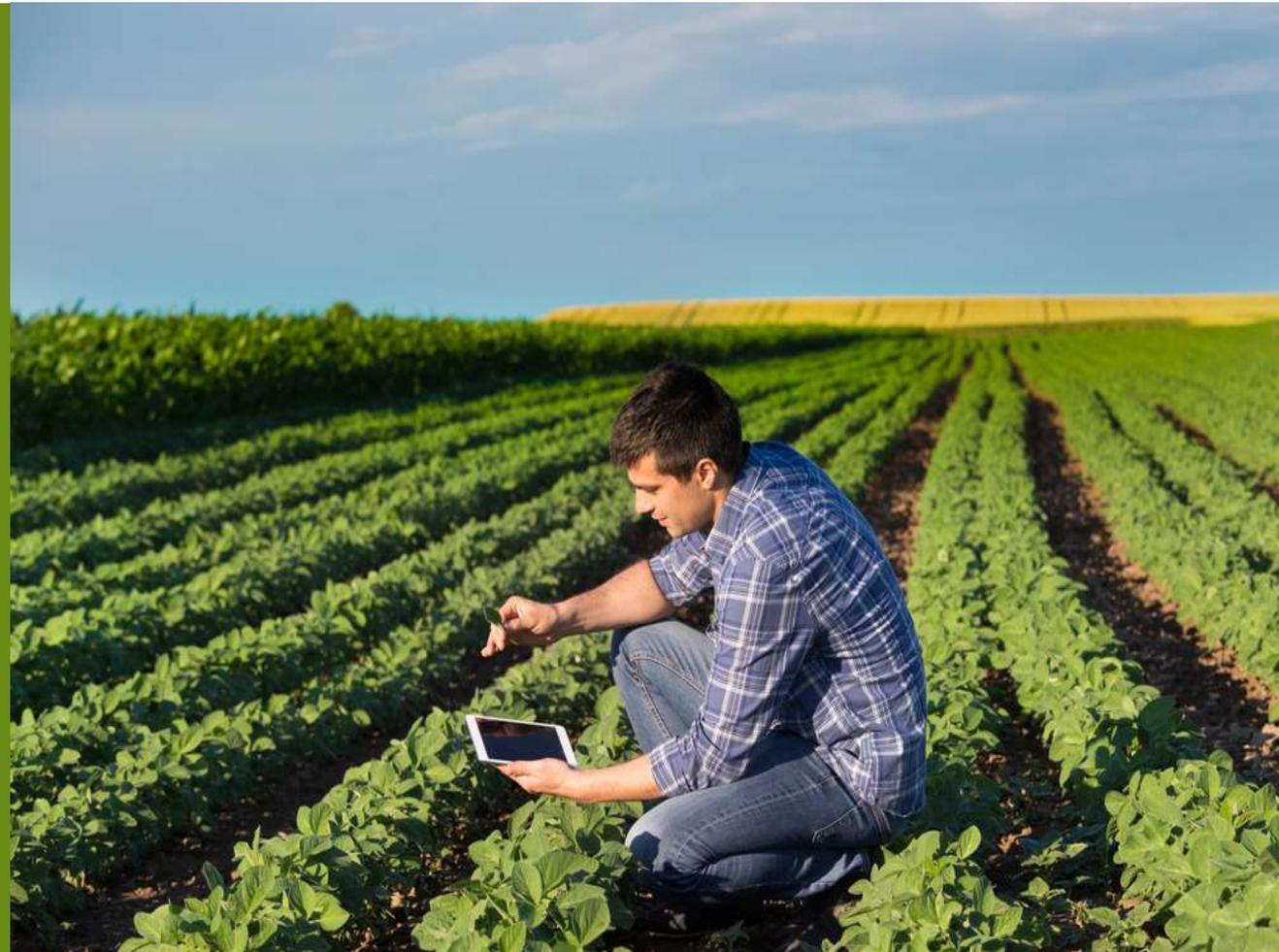
- Transparency
- Trust
- Environmental impact
- Sustainability
- Consumer choice



# Farming with One Hand Tied Behind the Back!



- Regulatory hurdles
- Government policy
- Food chain requirements
- Changing consumer preferences
- Chemical and biological resistance
- Lack of effective tools
- Trade disputes
- Farmer profitability



The opportunity



# Innovation is the key



Chemical, physical  
and biological crop  
protection



Digital



Seeds and traits

**Multi-stakeholder collaboration will continue to enable innovation  
in agriculture**

# The 4th Industrial Revolution

## A new opportunity to solve challenges



## 4<sup>th</sup> Industrial Revolution

Fusion of technologies that is blurring the lines between physical, digital and biological spheres, collectively referred to as the cyber-physical systems.



# Digitalization is the engine that will drive the future of farming



Internet of Things  
can help increase  
ag productivity by  
**70% by 2050**



Source: FAO.

# New players in ag innovation



**The Yield** uses artificial intelligence to help farmers make more informed decisions



**Amazon** acquired Whole Foods in the next step of vertical integration into agriculture



**GV** invests in agricultural **technology startup**

# An emphasis on investment in Agtech will deliver innovation in the near term



- In flow of private capital
  - \$2.2 billion total capital investment in Agtech in 2018
  - 33% in ag inputs space
- No and size of deals increasing
- Exits through acquisition, IPOs and roll-ups
- Agribusinesses moving to “open innovation” model



SourcePitchbook

# Opportunities are abundant for the future of agriculture

Innovations and technology has never been higher in agriculture

- Seed technology
- Biological, physical and chemical crop protection
- Precision agriculture
- Digital tools & data analysis



# THANK YOU!

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