



Agriculture Division of DowDuPont

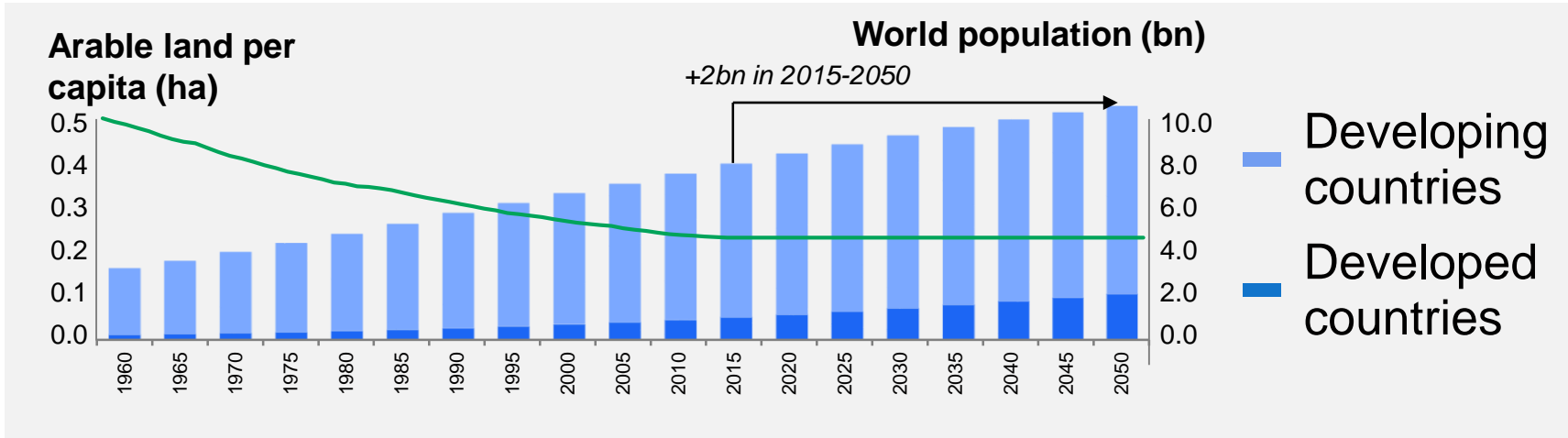
# The Role of Agricultural Technology in the Future of Midwest Farms: A Seed Sector View

Jerry Flint – Vice President, Global Initiatives and Sustainability

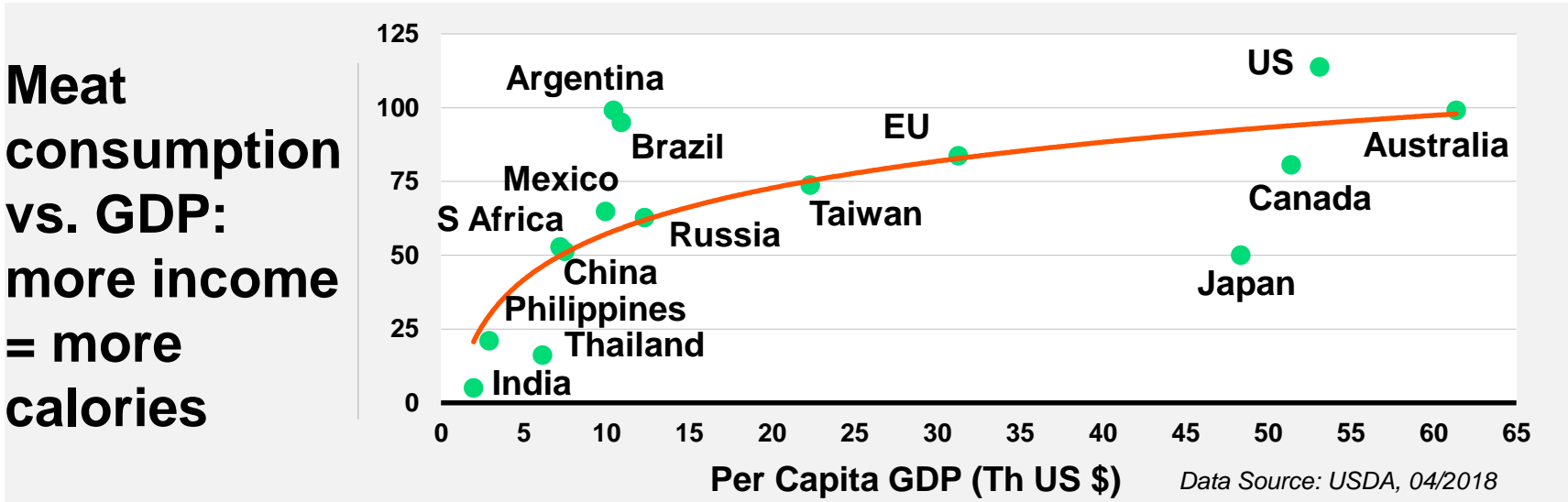
November 27, 2018

# Attractive Markets With Strong Secular Trends

**While a rising global population puts pressure on yields...**



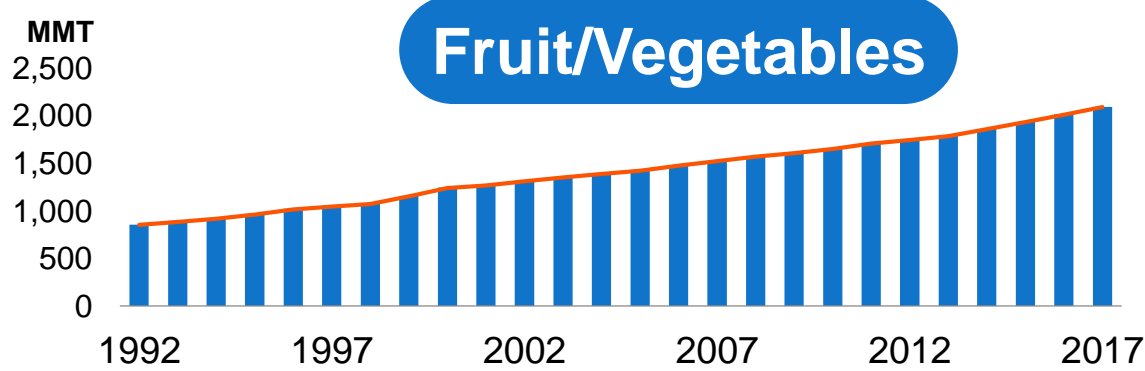
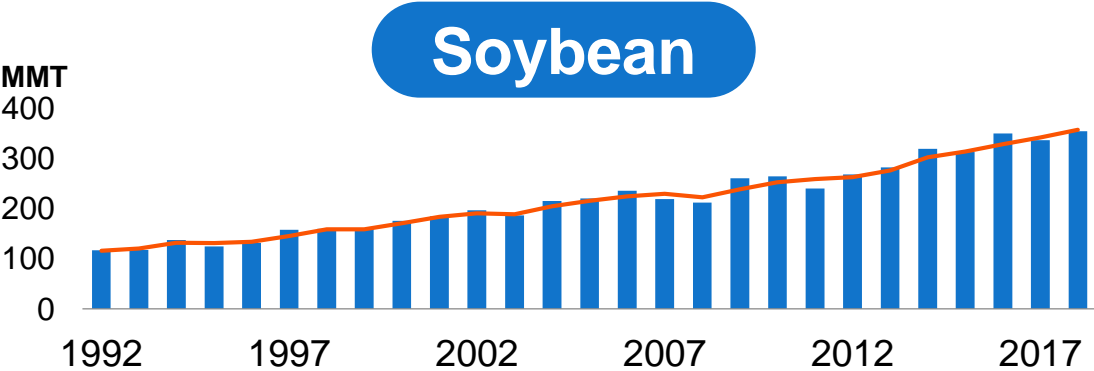
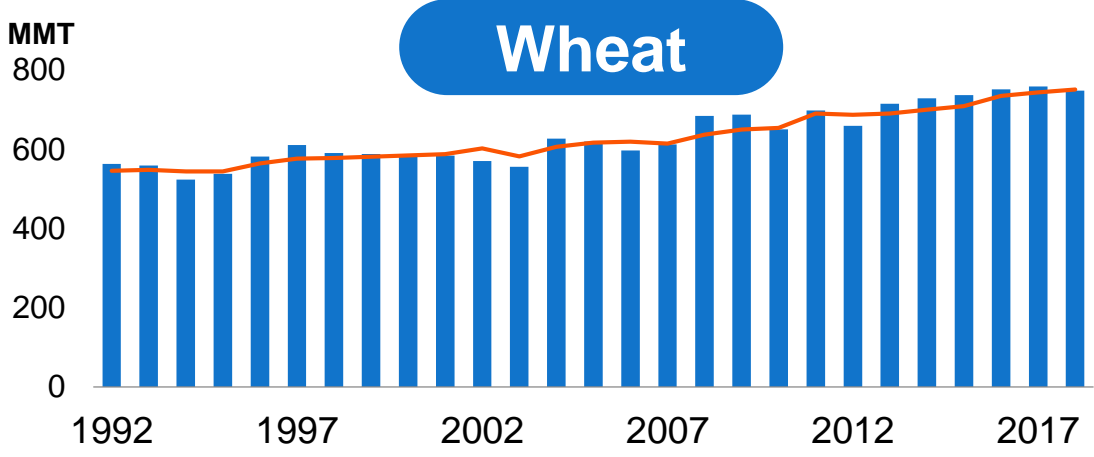
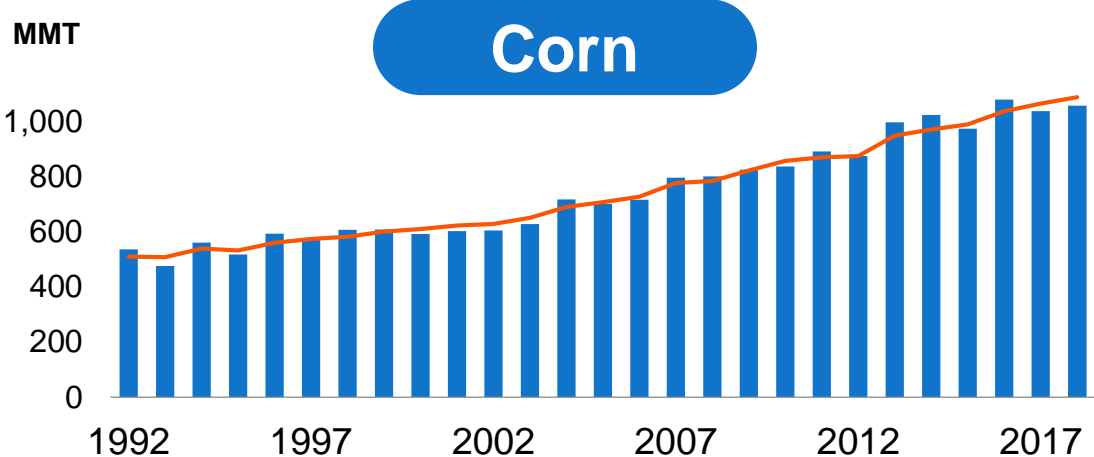
**...a growing middle class drives demand for animal feed**



Source: Food and Agriculture Organization of the United Nations (FAO), Seed Industry Synopsis, Phillips McDougall, October 2018 and internal analysis.

# Attractive Markets With Strong Secular Trends

**Agriculture continues to enjoy long-term secular trends across multiple crops**

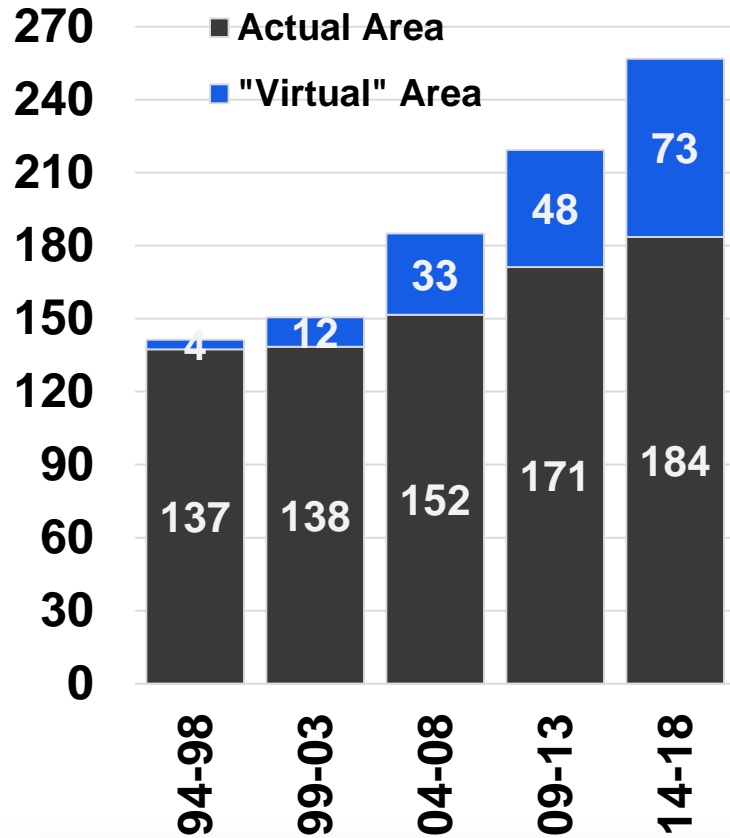


Source: Food and Agriculture Organization of the United Nations (FAO), Seed Industry Synopsis, Phillips McDougall and internal analysis.

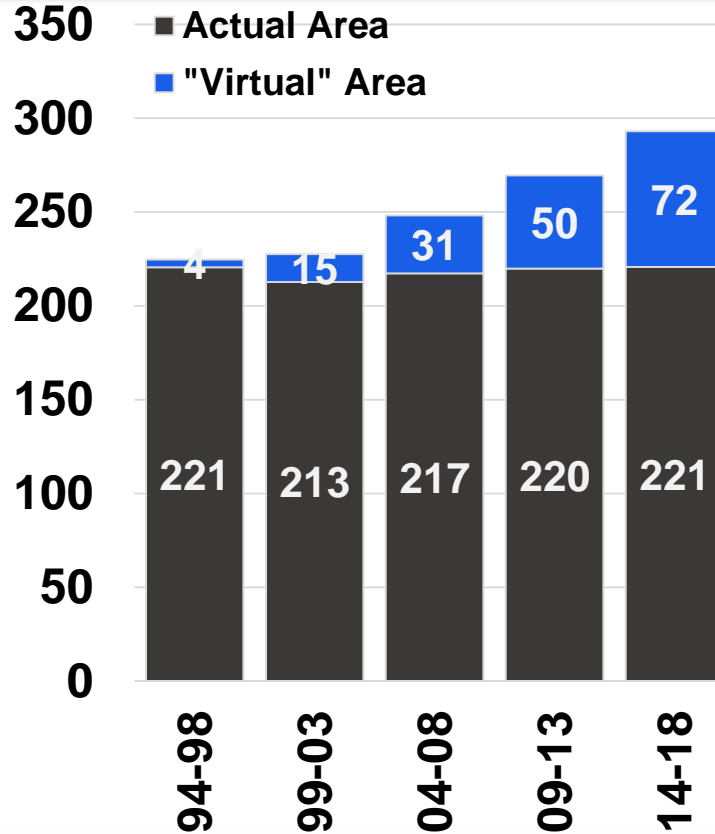
— Production  
— Consumption

# How Much "Virtual Area" Has Been Created by Improving Yields?

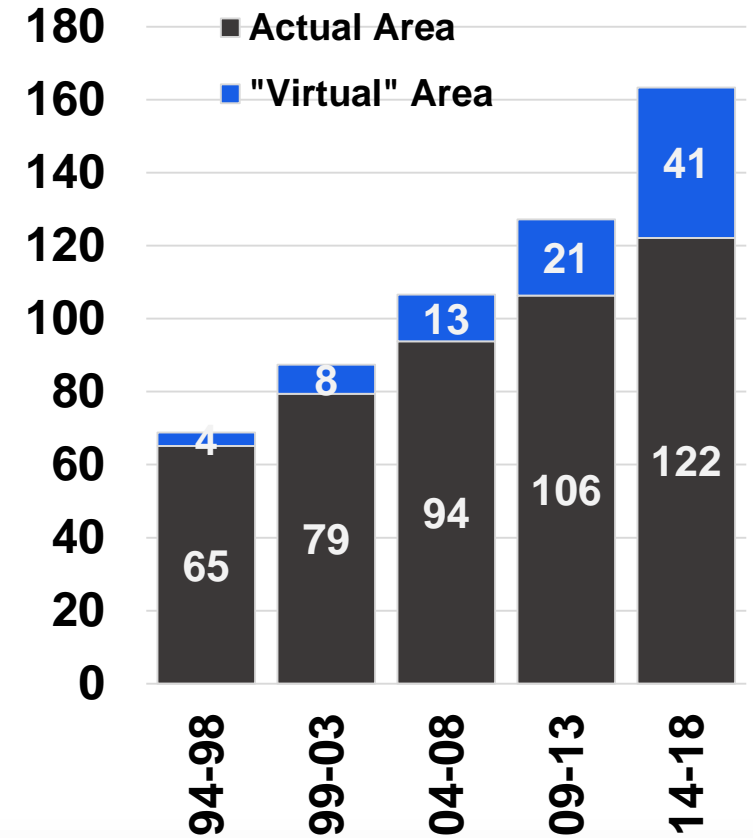
GLOBAL CORN (Mil HA Harvested)



GLOBAL WHEAT (Mil HA Harvested)



GLOBAL SOYBEANS (Mil HA Harvested)

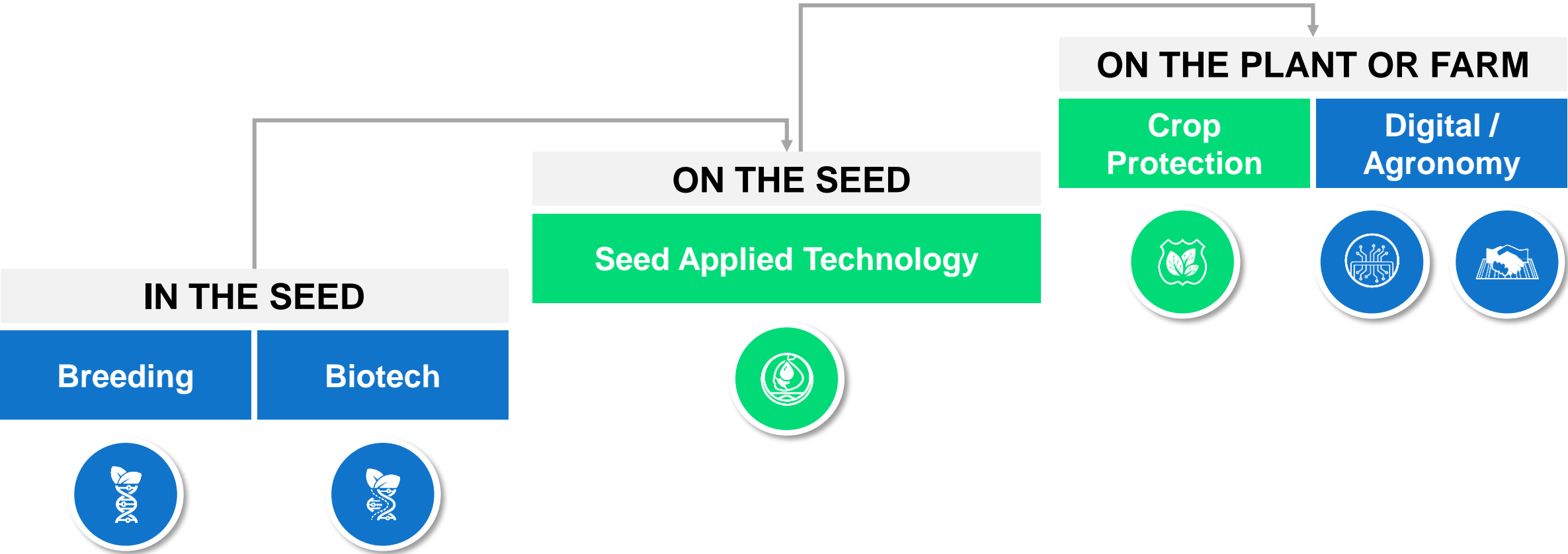


If global yields were stifled at 1992 levels, more land would have been brought into production to meet the growing global consumption. The "virtual area" was created by technology and put into practice by farmers to improve and protect crop productivity to meet the growing human demand on a limited resource base.

Data Source: USDA and Corteva Economic Analysis

# Technology enables a complete solution for farmers...

Broader product and service offering enabled by our R&D capabilities and robust pipeline



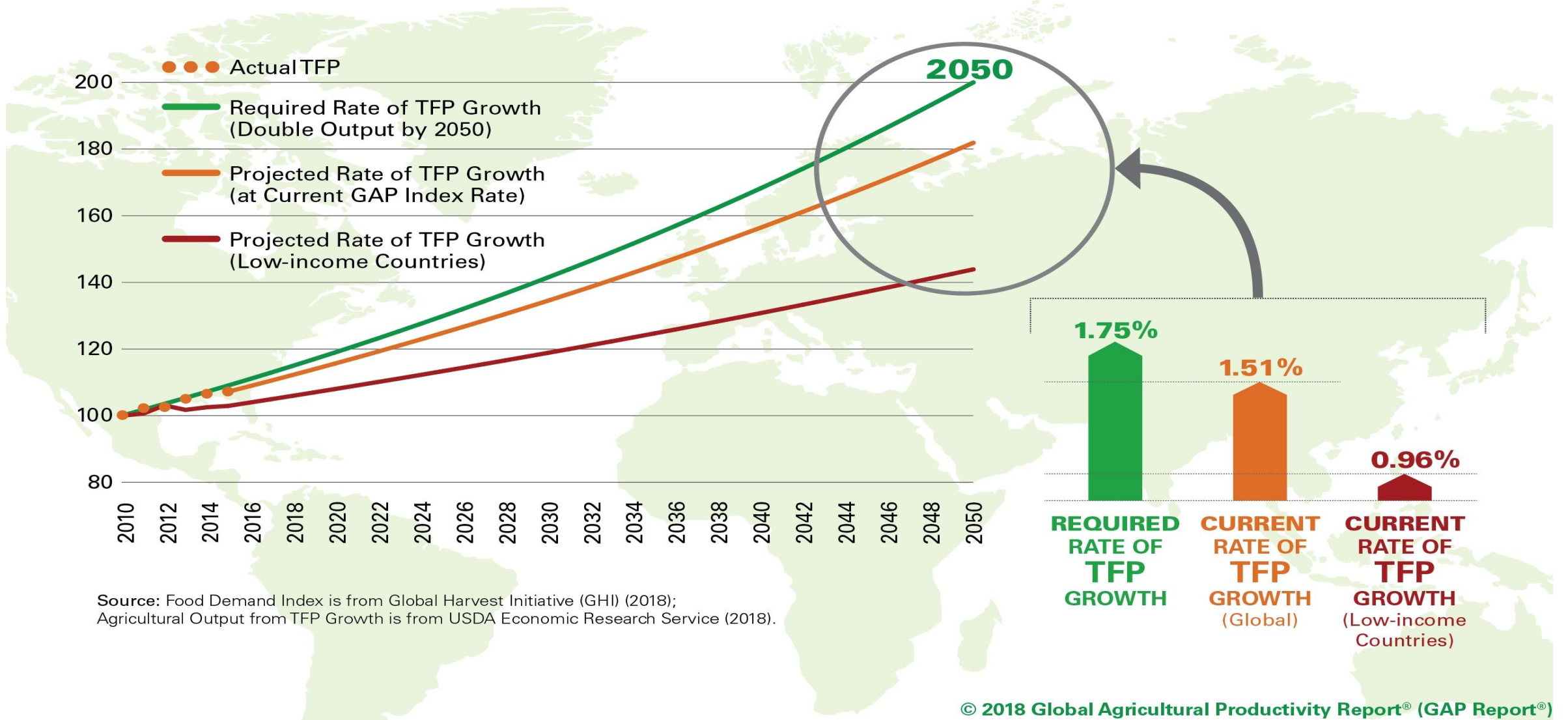
# Seed is a key delivery mechanism to crop improve productivity and address sustainability

- American Seed Trade Association
- Represents every sector, every crop – from alfalfa to zucchini
- Common goal – improve productivity through innovation in seed
- Continued innovation is critical to our future as we face challenges such as climate change, evolving pests and diseases, and a growing population

# Farmers Face a Changing Marketplace of Consumer Demand



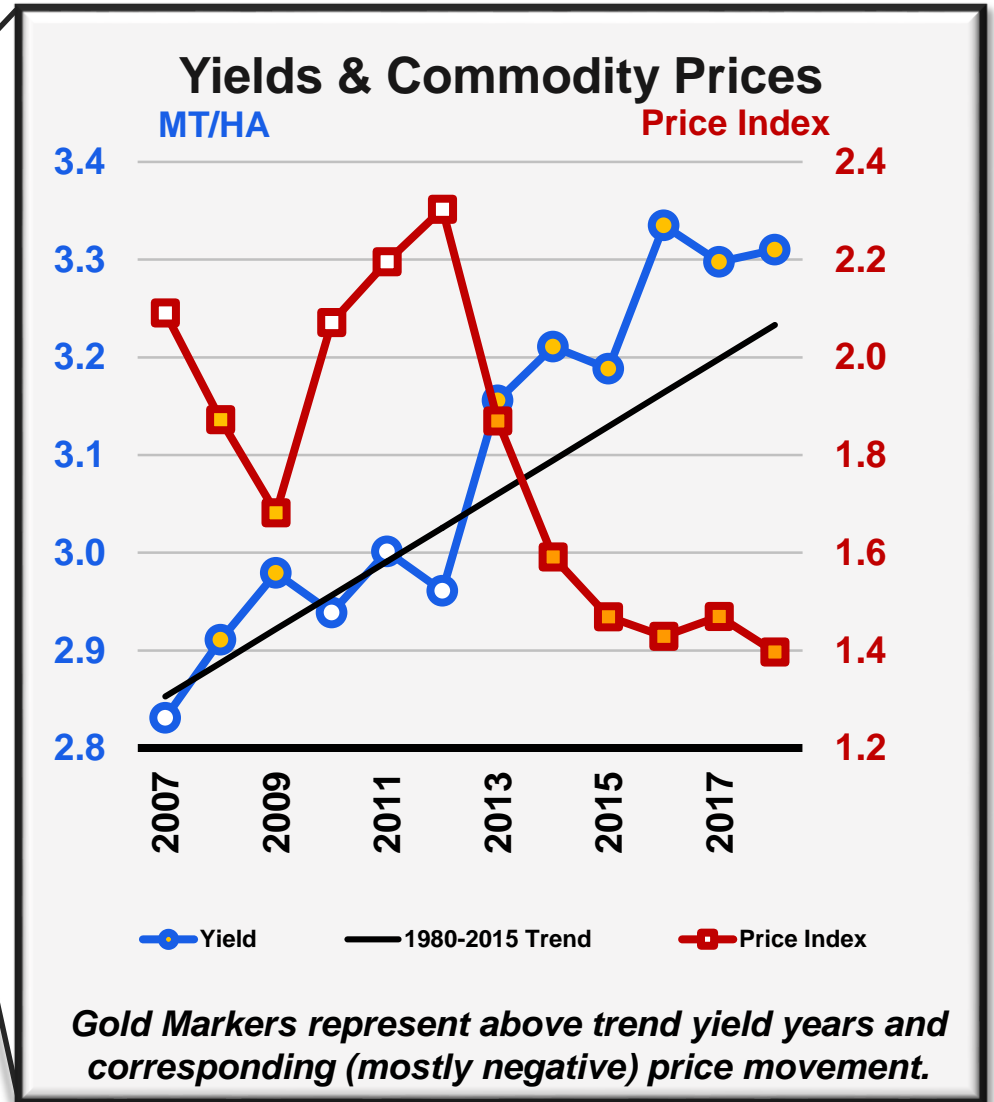
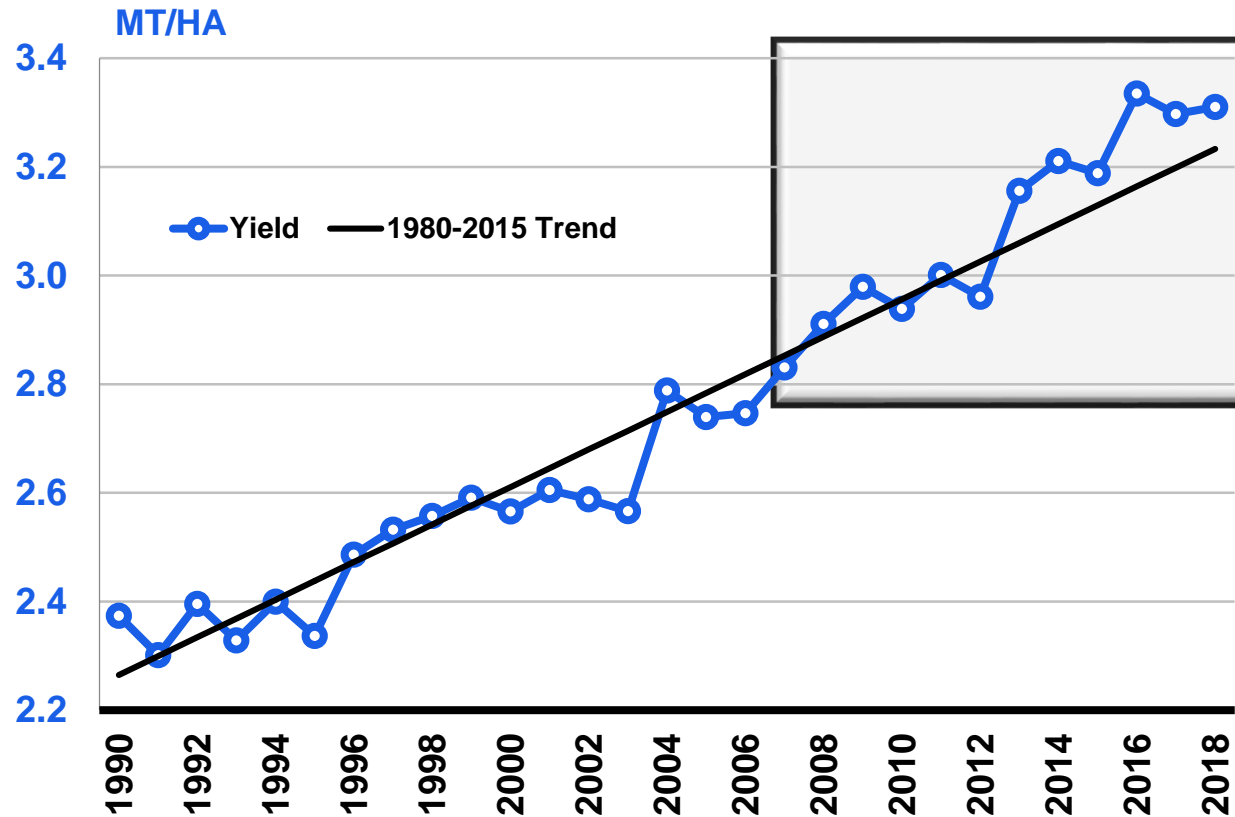
# THE GLOBAL AGRICULTURAL PRODUCTIVITY (GAP) INDEX™





# 6 Consecutive Years of Above Trend Yields → Pressures Prices

## Composite Yield Variability for Global Grain & Oilseeds



Note: Global yields per hectare for an aggregate of 9 grains (corn, wheat, rice, sorghum, barley, oats, rye, millet and mixed grains) and 5 oilseeds (soybeans, rapeseed, sunflower seed, peanuts and cottonseed). The price index is a simple average rice, wheat, corn and soybean prices, 1990-2005 (Pre-Biofuels) =1.00

# Farm Business Software and Data Analytics Are Being Developed and Adopted across Farms of all Size



## Efficiency

Get more done with less



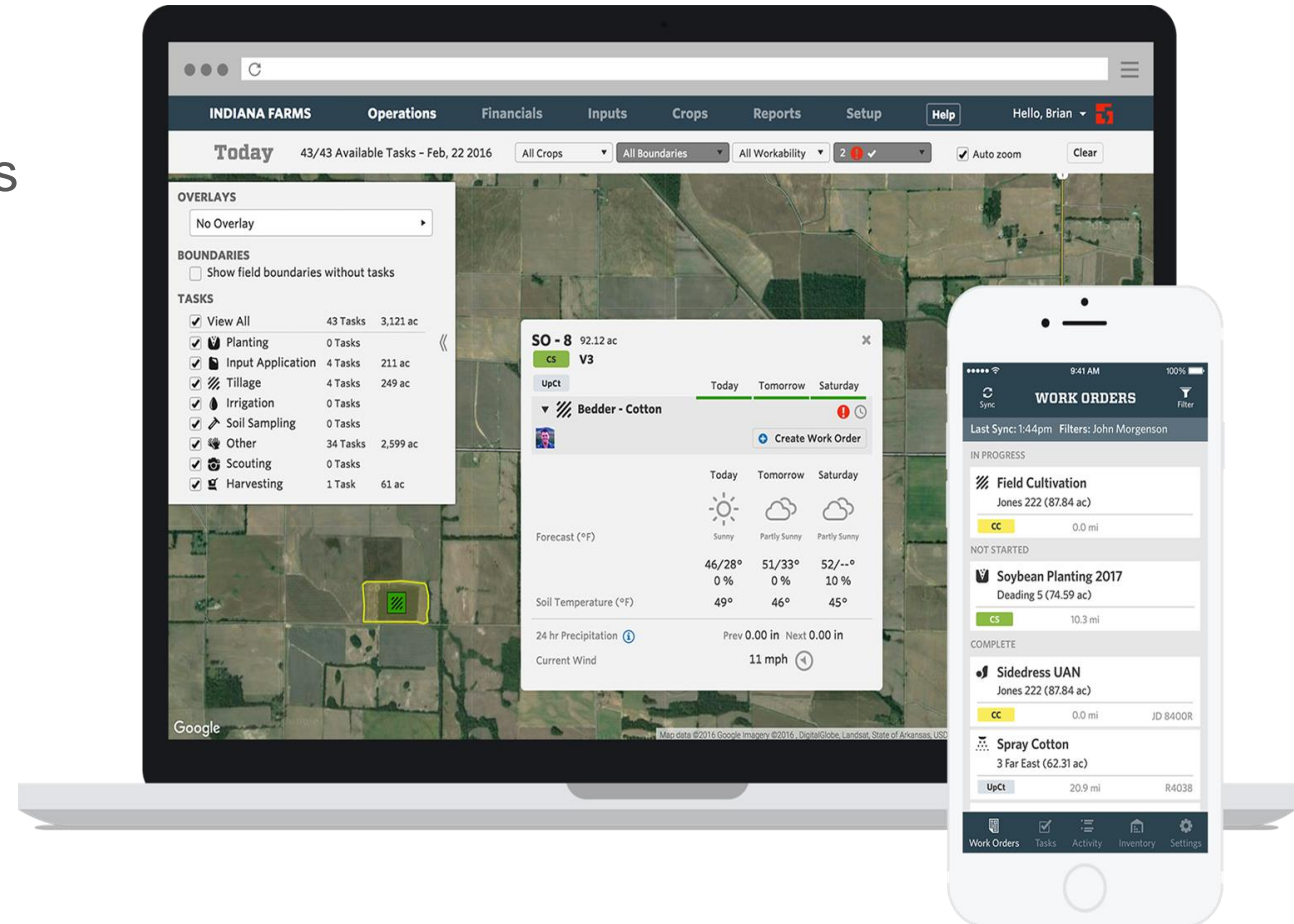
## Profitability

Make better decisions



## Sustainability

Build better networks, succession plans, and long term resource management



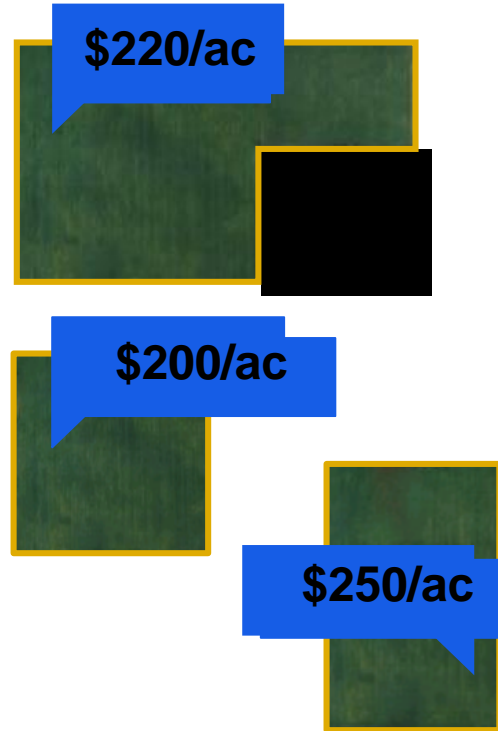
# Knowing makes a difference



How can I save more time and become more efficient?



How can I track my inventory in real time? What is my marketing plan?



What is my cost of production, down to the field?

Field Operations		Times or Qty	Unit	Labor @ \$20.00/hr	Fuel @ \$3.25/gal
1	Spray (Prior Year Stubble)	1	hr	1.00	0.39
2	Spray (Prior Year Stubble)	1	hr	1.00	0.39
3	Spray Fertilizer and herbicide	1	hr	1.00	0.39
4	Plant No-Till	1	hr	2.40	1.26
5	Spray	1	hr	1.00	0.39
6	Spray	1	hr	1.00	0.39
7	Combine Dryland Corn	1	115 bu	3.54	5.81
8	Truck	1	hr	1.64	0.84
9	Dry Grain	1	hr	0.00	0.00
10	Dry Grain	1	hr	0.00	0.00
11	Dry Grain	1	hr	0.00	0.00
12	Dry Grain	1	hr	0.00	0.00
13	Dry Grain	1	hr	0.00	0.00
14	Dry Grain	1	hr	0.00	0.00
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16	Dry Grain	1	hr	0.00	0.00
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18	Dry Grain	1	hr	0.00	0.00
19	Dry Grain	1	hr	0.00	0.00
20	Dry Grain	1	hr	0.00	0.00
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78	Dry Grain	1	hr	0.00	0.00
79	Dry Grain	1	hr	0.00	0.00
80	Dry Grain	1	hr	0.00	0.00
81	Dry Grain	1	hr	0.00	0.00
82	Dry Grain	1	hr	0.00	0.00
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84	Dry Grain	1	hr	0.00	0.00
85	Dry Grain	1	hr	0.00	0.00
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87	Dry Grain	1	hr	0.00	0.00
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89	Dry Grain	1	hr	0.00	0.00
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93	Dry Grain	1	hr	0.00	0.00
94	Dry Grain	1	hr	0.00	0.00
95	Dry Grain	1	hr	0.00	0.00
96	Dry Grain	1	hr	0.00	0.00
97	Dry Grain	1	hr	0.00	0.00
98	Dry Grain	1	hr	0.00	0.00
99	Dry Grain	1	hr	0.00	0.00
100	Dry Grain	1	hr	0.00	0.00

Can I get **more value** out of all this data?

# Summary and Conclusions

- Innovation is required to stay on trend yields across the major food crops
- Consumer preferences create higher value segments for short periods of time
- Marketing at the farm level is critical as we move through this cycle
- Long term outlook remains positive