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

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Attractive Markets With Strong Secular Trends

While a rising global population puts pressure on yields…

…a growing middle class drives demand for animal feed

Meat consumption vs. GDP: more income = more calories

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

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Food and Agriculture Organization of the United Nations (FAO), Seed Industry Synopsis, Phillips McDougall and internal analysis.
How Much “Virtual Area” Has Been Created by Improving Yields?

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

IN THE SEED

Breeding
Biotech

ON THE SEED

Seed Applied Technology

ON THE PLANT OR FARM

Crop Protection
Digital / Agronomy
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

Healthy food supply
Knowing the food’s “story”
Less food waste
Cleaner labels
Environmental sustainability
THE GLOBAL AGRICULTURAL PRODUCTIVITY (GAP) INDEX™

- **Actual TFP**
- **Required Rate of TFP Growth** (Double Output by 2050)
- **Projected Rate of TFP Growth** (at Current GAP Index Rate)
- **Projected Rate of TFP Growth** (Low-income Countries)

Source: Food Demand Index is from Global Harvest Initiative (GHI) (2018); Agricultural Output from TFP Growth is from USDA Economic Research Service (2018).

6 Consecutive Years of Above Trend Yields → Pressures Prices

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 of 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?

Can I get more value out of all this data?

$220/ac
$200/ac
$250/ac
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