



# ANNUAL R&D PIPELINE REVIEW

*January 5, 2017*





# Forward Looking Statements

## Trademarks

Trademarks owned by Monsanto Company and its wholly-owned subsidiaries are italicized in this presentation. All other trademarks are the property of their respective owners.

## Fiscal Year

References to year, or to fiscal year, are on a fiscal year basis and refer to the 12-month period ending August 31.

Certain statements contained in this presentation are “forward-looking statements,” such as statements concerning the company’s anticipated financial results, current and future product performance, regulatory approvals, business and financial plans and other non-historical facts, as well as the pending transaction with Bayer Aktiengesellschaft (“Bayer”). These statements are based on current expectations and currently available information. However, since these statements are based on factors that involve risks and uncertainties, the company’s actual performance and results may differ materially from those described or implied by such forward-looking statements. Factors that could cause or contribute to such differences include, among others: risks related to the pending transaction between the company and Bayer, including the risk that the regulatory approvals required for the transaction may not be obtained on the anticipated terms or time frame or at all, the risk that the other conditions to the completion of the transaction may not be satisfied, the risk that disruptions or uncertainties related to the pending transaction could adversely affect the company’s business, financial performance and/or relationships with third parties, and the risk that certain contractual restrictions during the pendency of the transaction could adversely affect the company’s ability to pursue business opportunities or strategic transactions; continued competition in seeds, traits and agricultural chemicals; the company’s exposure to various contingencies, including those related to intellectual property protection, regulatory compliance and the speed with which approvals are received, and public understanding and acceptance of our biotechnology and other agricultural products; the success of the company’s research and development activities; the outcomes of major lawsuits, including potential litigation related to the pending transaction with Bayer; developments related to foreign currencies and economies; fluctuations in commodity prices; compliance with regulations affecting our manufacturing; the accuracy of the company’s estimates related to distribution inventory levels; the recent increases in levels of indebtedness, continued availability of capital and financing and rating agency actions; the company’s ability to fund its short-term financing needs and to obtain payment for the products that it sells; the effect of weather conditions, natural disasters, accidents, and security breaches, including cybersecurity incidents, on the agriculture business or the company’s facilities; and other risks and factors detailed in the company’s most recent periodic report to the SEC. Undue reliance should not be placed on these forward-looking statements, which are current only as of the date of this presentation. The company disclaims any current intention or obligation to update any forward-looking statements or any of the factors that may affect actual results.

The information on unregistered pesticides in this presentation is for educational purposes and is not an offer to sell or use any unregistered product mentioned in this presentation.

# Monsanto's Leading R&D Pipeline

*Extending leadership with proven product performance and integrated pipeline*

## Value

- Core pipeline expected to deliver up to **\$25B** of peak net sales<sup>2</sup>, with incremental value from new platforms
- **4th** straight year of **>20** pipeline advancements, balanced across the portfolio
- **14** projects advancing to launch; including **6** in Climate *FieldView*

## Product Performance

- *DEKALB* corn outperforms competitors for **11th** consecutive year; avg. **7-10** bu/ac yield advantage
- *Deltapine* outperforms for **7th** consecutive year; this year avg. **>80** lbs/ac yield advantage
- Targeting to increase corn rate of genetic gain by **30%**

## Integrated Pipeline

- Multiple next generations of insect and weed control biotech traits
- Plans to launch **7** new seed treatments through 2019, including *NemaStrike* Technology and *Acceleron* B300 SAT from our BioAg Alliance
- **>35** projects in Climate *FieldView* pipeline
- **5** agreements in gene editing

*Agreement to combine with Bayer<sup>1</sup> provides opportunity to optimize integration of solutions, expand offerings and accelerate delivery to growers*

1. The acquisition is subject to customary closing conditions, including receipt of required regulatory approvals. 2. Peak net sales reflects estimated global sales opportunity around peak penetration year for products in the core pipeline, which includes biotech, breeding and crop protection.

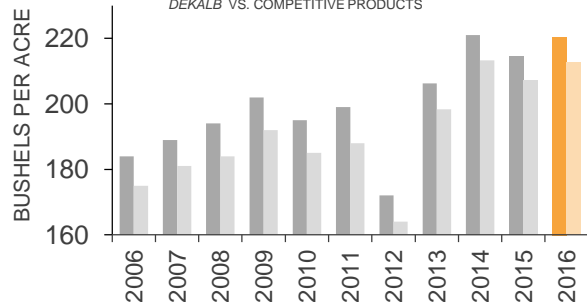
# Year-in, Year-out Performance Confirms Overall Advantage Across *DEKALB*, *Asgrow* and *Deltapine*

*Advancements in breeding program provides potential to increase future genetic gain*

## CORN: *DEKALB*

2016 U.S. COMPETITIVE CORN YIELD COMPARISON<sup>1</sup>:

*DEKALB VS. COMPETITIVE PRODUCTS*



■ *DEKALB* NATIONAL YIELD  
■ U.S. COMPETITIVE SET NATIONAL YIELD

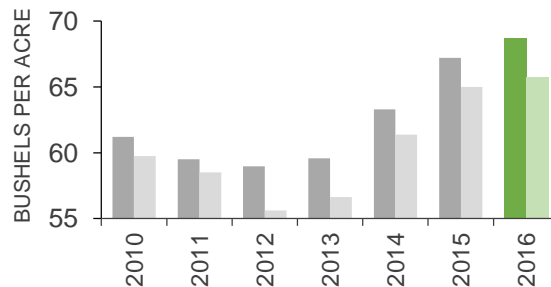
- *DEKALB* outperforms competitive products for the 11<sup>th</sup> consecutive year
- Consistent 7-10 bu/ac average yield advantage

1. Annual yield advantage calculated each year by comparing 5 leading *DEKALB* products within each state having a minimum of 100 comparisons to national competitor products containing similar crop protection traits as of December 15, 2016. All comparisons are head-to-head using +/- 2RMs and weighted average calculated using 15% moisture.

## SOY: *Asgrow*

2016 U.S. COMPETITIVE SOY YIELD COMPARISON<sup>2</sup>:

*ASGROW VS. COMPETITIVE PRODUCTS*



■ *Asgrow* NATIONAL YIELD  
■ U.S. COMPETITIVE SET NATIONAL YIELD

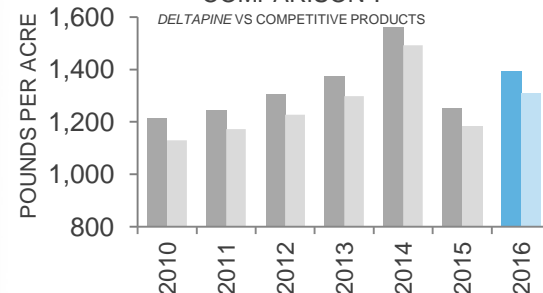
- *Asgrow* outperforms competition for the 7<sup>th</sup> consecutive year
- Strong performance advantage of >2 bu/ac on average

2. Data as of December 12, 2016. Includes all pre-commercial and commercial strip trial data. All head-to-head comparisons are within +/- 0.2 day maturity. Data represents *Asgrow* vs Alternative Platform (a minimum of 30 comparisons per product within a state).

## COTTON: *Deltapine*

2016 U.S. COMPETITIVE COTTON YIELD COMPARISON<sup>3</sup>:

*DELTA PINE VS. COMPETITIVE PRODUCTS*



■ *DELTA PINE* VARIETIES  
■ U.S. COMPETITIVE VARIETIES

- *Deltapine* outperforms competition for 7<sup>th</sup> consecutive year
- Strong performance advantage of >80 lbs/ac on average this year

3. Data as of December 14, 2016. Annual yield advantage calculated comparing commercially available leading *Deltapine* products across geographies to leading commercially available competitive products with similar crop protection traits.

# Opportunity To Extend Leadership in Corn With Biotech Insect & Weed Control Solutions

*Monsanto's corn traits today are on >100M acres; opportunity to deliver increased value to growers with multi-gen portfolio*

## Corn



### INSECT CONTROL

PEAK NET SALES<sup>1</sup>  
**\$1.5B - \$2.0B**

- **Phase 4 projects** in both above-ground and below-ground solutions

**SmartStax<sup>PRO</sup>**  
pending regulatory approval

**Acre Opportunity: >100M acres across the Americas**

- 3 modes-of-action for corn rootworm control
- Novel RNAi mode-of-action

## Near Term

**Trecepta<sup>™</sup>**  
pending regulatory approval

**Acre Opportunity: Southern U.S. & S. America**

- 3 modes-of-action against corn earworm
- Protection against fall armyworm, corn borers and cutworms

## Longer Term

- **4<sup>th</sup> GEN Phase 2 projects** in both above-ground and below-ground solutions targeting to:

- Combine novel protein and proprietary RNAi modes-of-action
- Offer multiple modes-of-action against each key pest and durability against key lepidopteran pests



### WEED CONTROL

PEAK NET SALES<sup>1</sup>  
**\$1.0B - \$1.5B**

### 3<sup>RD</sup> GEN Herbicide Tolerance Phase 4

- Tolerance to glyphosate, dicamba and glufosinate
- Submitted regulatory submissions for global approval

### 2016 Monsanto Trials Jerseyville, IL



Non-Treated      Traited – 3<sup>rd</sup> GEN

### 4<sup>th</sup> GEN advances to Phase 3

- Tolerance to five herbicides - dicamba, glufosinate, glyphosate, FOPs, and 2,4-D for post-emergence control of tough grasses and broadleaf weeds

1. Peak net sales reflects estimated global sales opportunity around peak penetration year for products in the core pipeline, which includes biotech, breeding and crop protection.

# Opportunity To Extend Leadership in Soy With Biotech Insect & Weed Control Solutions

*Monsanto's soy traits today are on >200M acres; opportunity to deliver increased value to growers with multi-gen portfolio*

## Soy



### INSECT CONTROL

PEAK NET SALES<sup>1</sup>  
**\$0.5B - \$1.0B**

## Near Term

### 2<sup>nd</sup> GEN Insect Protection – Phase 4

*Acre Opportunity : > 100M acres*

- Multiple modes-of-action to improve durability and expand the insect spectrum to include armyworm and podworm complexes
- 2020 planned commercial launch

Control



2<sup>nd</sup> GEN



## Longer Term

### 3<sup>rd</sup> GEN Insect Protection Phase 2

*Acre Opportunity: > 100M acres*

- Multiple modes-of-action to provide protection against primary and secondary pests to further improve durability against an expanded spectrum of insects



### WEED CONTROL

PEAK NET SALES<sup>1</sup>  
**\$1.5B - \$2.0B**

### 3<sup>RD</sup> GEN Weed Control System Phase 4

- Tolerance to glyphosate, dicamba & glufosinate

2016 Monsanto Field Trials • Collinsville, IL

Non-Treated



Treated



### 4<sup>th</sup> GEN Phase 2

- Expected to provide enhanced flexibility of combining herbicides
- Field trials demonstrated crop tolerance to glyphosate, dicamba, glufosinate, HPPD and another mode-of-action
- Multiple gene vector strategy designed to improve breeding efficiency and yield performance

1. Peak net sales reflects estimated global sales opportunity around peak penetration year for products in the core pipeline, which includes biotech, breeding and crop protection.

# Seed Applied Solutions Play an Important Role in Monsanto's Integrated System Offerings

Targeting launches of up to seven products in the U.S. through 2019 under current portfolio

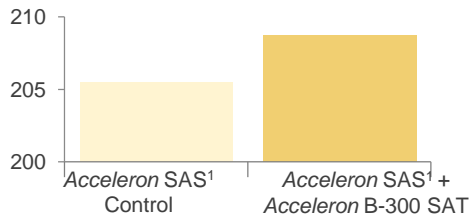
## ACCELERON<sup>®</sup> B-300 SAT

### 2016 & 2015 U.S. Field Testing Results

#### IMPROVING NUTRIENT

#### ACCESS:

2 year average yield data across 78 locations supports >3 BU/AC average yield advantage



Trials demonstrated enhanced corn root development with *Acceleron SAS*<sup>1</sup> + microbial treatment vs. *Acceleron* only



Acceleron SAS Control

Acceleron SAS + Acceleron B-300 SAT



## NEMASTRIKE<sup>™</sup> TECHNOLOGY

Novel nematode-control technology with a fit on 125M acres of opportunity across corn, soy and other crops

### Monsanto Field Trials • Collinsville, IL • July 2016

3 year avg yield advantage approximately 7 bu/ac



No Nematicide Treatment

Competitive Standard 1

Competitive Standard 2

Acceleron SAS with NemaStrike Technology<sup>1</sup>

- Outstanding protection of roots treated with *NemaStrike* Technology<sup>1</sup>
- Better root system can translate to higher yield, better standability of the crop

1. Product is subject to regulatory approvals and is expected to be branded as *NemaStrike* Technology

# Bayer, Monsanto Combination<sup>1</sup> to Create Global Leader in Ag with Annual Combined Pro Forma R&D Budget of Approximately \$2.7B

*Combination accelerates innovation, optimizes integrated solutions and expands benefits to new crops, geographies*

## EXPECTED BENEFITS:

- **Increases Innovation**  
Accelerates pace of innovation and efficiency of R & D
- **Delivers the Future of Agriculture**  
Drives emerging technologies reshaping agriculture throughout the industry
- **Benefits Society and Consumers**  
Supports the sustainable production of improved harvests on each acre
- **Benefits Farmers**  
Enables farmers to be more productive, profitable and sustainable through broadly licensed tools expected to provide additional competitive offerings and choices

## RESULTING FROM:

- **Accelerated Innovation**  
Parallel vs. sequential development for herbicide tolerance system solutions
- **Optimized Integrated Solutions**  
Integrated development seed, chemistry and digital ag tools to optimize timing, placement and combinations of solutions for improved productivity and resistance management
- **Expanded Offerings**  
Creation of scale in emerging countries and cross-fertilization of tool development in underfunded crops like wheat

1. The acquisition is subject to customary closing conditions, including receipt of required regulatory approvals.



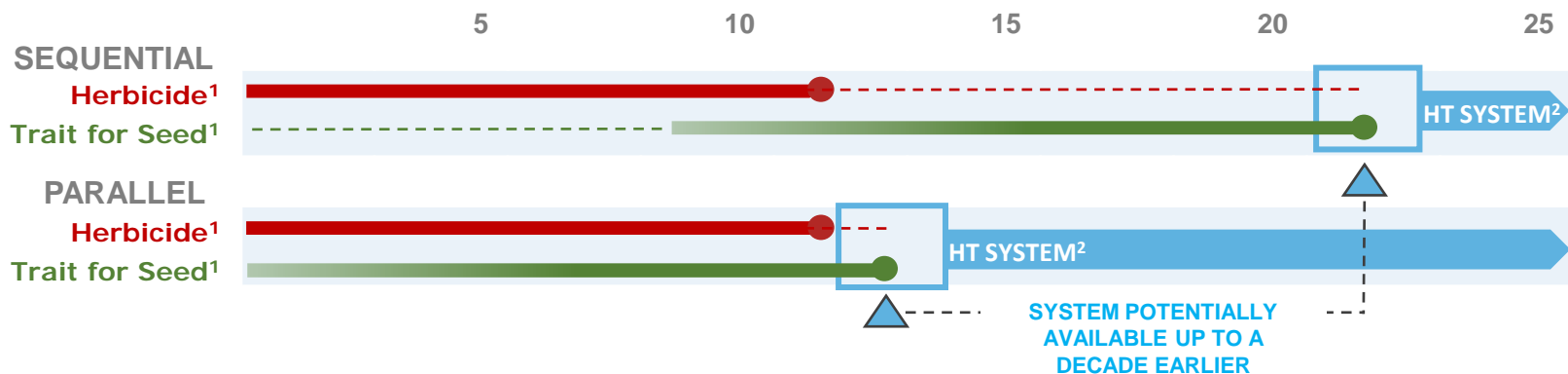
# Bayer and Monsanto Combination<sup>3</sup>: Unlocking Significant Innovation Potential

*Better products to farmers faster*

- From the discovery phase through commercialization, parallel development of the herbicide and the trait can better facilitate joint testing, prioritization and integration
- This can lead to developing products for farmers faster, shaving years off of the delivery timelines
- Accelerated earnings can then be allocated into additional areas of R&D

## EXAMPLE:

SEQUENTIAL VS. PARALLEL HERBICIDE TOLERANCE (HT) DEVELOPMENT: Approx. Timeline (years)



# Disease Management Provides One of Most Compelling Needs and Opportunities for Integrated Solutions

*Optimization of genetics, traits, chemistry, seed treatments and digital ag for improved productivity and profitability*

*Disease outbreaks are complex and environment dependent. There's no single product to manage the problem, so farmers are left with a sub-optimal approach.*

  
 Disease Shield hybrid  
 +  
  
 with Enhanced Disease Control  
 +  
 Microbes and Bayer seed treatments



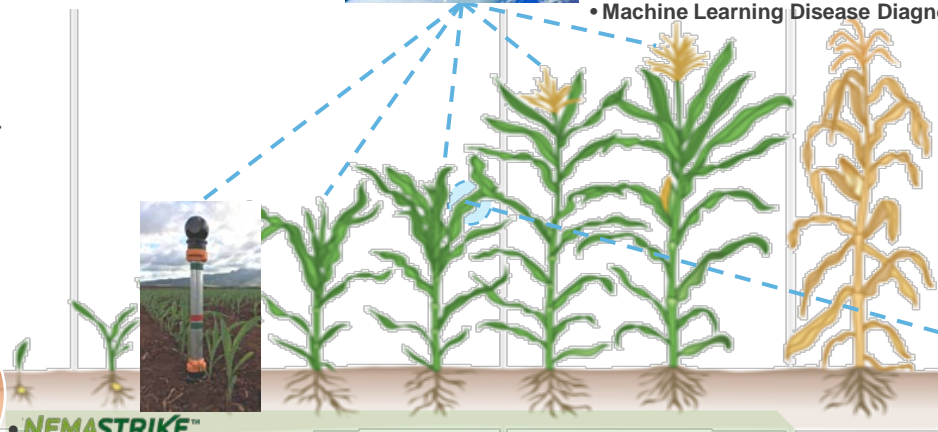
CLIMATE  
**FIELD VIEW**



- Field Health Monitoring
- Soil Moisture & Temp. Probe (in-field)
- Disease Vulnerability & ID
- Enhanced Directed Scouting
- Machine Learning Disease Diagnosis



***Integrated solutions can deliver a comprehensive, season-long approach that combines scientific tools that have never been used together to fight disease.***



- **NEMASTRIKE™ TECHNOLOGY**
- Fusarium Stalk Rot Resistance & Anthracnose Stalk Rot Resistance



Optimal application of current *and* future fungicides to preserve yield



## DISEASE MANAGEMENT STAGES



# Monsanto's Leading R&D Pipeline

*Extending leadership with proven product performance and integrated pipeline*

## Value

- Core pipeline expected to deliver up to **\$25B** of peak net sales<sup>2</sup>, with incremental value from new platforms
- **4th** straight year of **>20** pipeline advancements, balanced across the portfolio
- **14** projects advancing to launch; including **6** in Climate *FieldView*

## Product Performance

- *DEKALB* corn outperforms competitors for **11th** consecutive year; avg. **7-10** bu/ac yield advantage
- *Deltapine* outperforms for **7th** consecutive year; this year avg. **>80** lbs/ac yield advantage
- Targeting to increase corn rate of genetic gain by **30%**

## Integrated Pipeline

- Multiple next generations of insect and weed control biotech traits
- Plans to launch **7** new seed treatments through 2019, including *NemaStrike* Technology and *Acceleron* B300 SAT from our BioAg Alliance
- **>35** projects in Climate *FieldView* pipeline
- **5** agreements in gene editing

*Agreement to combine with Bayer<sup>1</sup> provides opportunity to optimize integration of solutions, expand offerings and accelerate delivery to growers*

1. The acquisition is subject to customary closing conditions, including receipt of required regulatory approvals. 2. Peak net sales reflects estimated global sales opportunity around peak penetration year for products in the core pipeline, which includes biotech, breeding and crop protection.

# APPENDIX







# Climate *FieldView* Digital Ag Pipeline

FOCUS AREA	PLATFORM: PRODUCT DELIVERABLE ➤ Denotes Product Advancement	PHASE 1 Proof of Concept	PHASE 2 Development	PHASE 3 Pre-Commercial	PHASE 4 Commercial/Launch	PHASE 5 Post-Commercial
FERTILITY	Whole-Field Nitrogen Monitoring	➤				
	➤ Sub-Field Nitrogen Monitoring	COMMERCIAL HIGHLIGHT ➤				
	➤ Grid Soil Test Data Ingest and Layers Visualization (OM, CEC, pH)	COMMERCIAL HIGHLIGHT ➤				
	Manual Nitrogen Scripting	➤				
	P&K Scripting	➤				
	Advanced Nitrogen Scripting	➤				
	Advanced Scripting with Sensors & Imagery	➤				
SEED & PLANTING	Whole Field Nitrogen Monitoring (Canola, Wheat)	➤				
	➤ Advanced Seed Scripting, Population by Field Zone	COMMERCIAL HIGHLIGHT ➤				
	Product Selection by Geographic Region	➤				
	Enhanced Field Zones & Improved Seeding	➤				
	Product Selection by Field	➤				
	Seed Portfolio Optimization	➤				
	Advanced Seed Scripting (Soybeans)	➤				
FIELD INSIGHTS	Manual Seed Scripting (Wheat)	➤				
	Field Health Monitoring	➤				
	Field Analysis (All major row crops and broad-acre crops except cotton)	➤				
	➤ Yield Analysis	COMMERCIAL HIGHLIGHT ➤				
	Corn Disease Vulnerability Identification (GLS, NLB)	➤				
	Field Analytics (Cotton)	➤				
	Field Health Monitoring (Wheat, Cotton, Alfalfa, Canola)	➤				
	Stress Identification	➤				
	Enhanced Directed Scouting	➤				
	Yield Productivity Enhancement through Benchmarking Analytics	➤				
WEATHER	Disease Diagnosis & Prediction (Corn)	➤				
	Disease Diagnosis & Prediction (Soybeans, Wheat)	➤				
	➤ Precipitation Accuracy Improvements	COMMERCIAL HIGHLIGHT ➤				
	Windspeed Spray Advisor	➤				
	MEASUREMENTS	Climate <i>Fieldview</i> Digital HUB	➤			
Climate <i>FieldView</i> Gauge for Enhanced Precipitation		➤				
Climate <i>FieldView</i> Soil Moisture and Temperature Probe		➤				
On-Equipment Soil Mapping		➤				
Nitrate Sensor		➤				
DATA CONNECTIVITY & PLATFORM	Equipment Compatibility Expansion (Planters, Combines, Sprayers, Fertilizer Spreaders)	ONGOING				
	Third-Party Data Integration & APIs	ONGOING				
	➤ Manual Data Upload	COMMERCIAL HIGHLIGHT ➤				
	Veris Technologies Platform Integration	➤				
	Third-Party Platform Collaborations	➤				




# BioDirect Technology Pipeline

*Leveraging genomics for completely new modes of action with more targeted pest control*

## BioDIRECT™ R&D Pipeline



**BioDirect Technology uses RNAi:** A natural mechanism to control the expression of a gene

 **Arrow** reflects advancement, progress or highlights tracking significant developments in R&D and commercial work.

## Pipeline Highlights:

- Bee Health Varroa Control advancing to Phase 3, expected to be first product to launch commercially from the BioDirect Technology Pipeline
- Learnings from Colorado Potato Beetle research, particularly delivery mechanisms, applied to Canola Flea Beetle project which continues to show positive results

# BioAg Alliance Pipeline

Industry's most advanced microbials platform and R&D capability

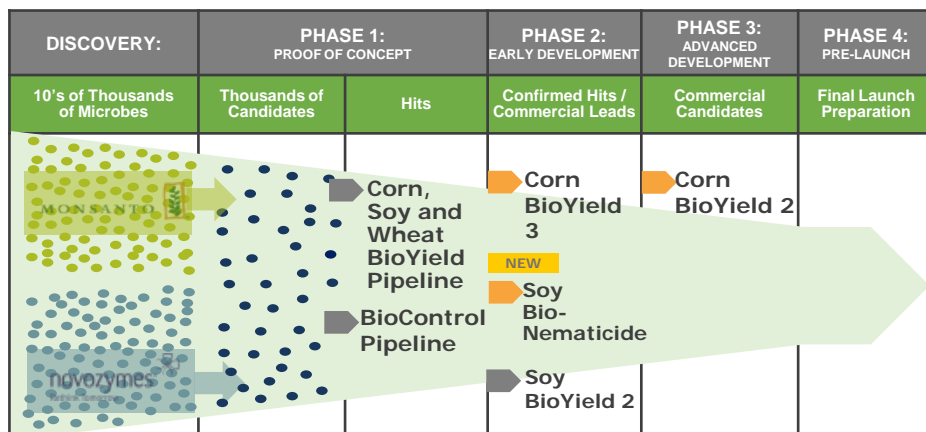


## Biologicals

Collaborative partnerships and research are driving innovative solutions to produce food in a sustainable way

Our technologies are on >80M acres today

## The BioAg Alliance: R&D Development Pipeline



➤ Pipeline Advancement

## The BioAg Alliance



## Pipeline Highlights:

- Corn BioYield 2 – adds incremental yield resulting in up to 5 bu/ac advantage overall<sup>1</sup>
- Corn BioYield 3 – lead strains show avg >3 bu/ac yield advantage
- Soy BioNematicide – additional tool for growers for nematode control

## Commercial Highlights



Launch of Commercial Products Leveraging Monsanto's Global Network

1. Corn BioYield 2 will be commercially offered with Corn BioYield 1

## Launching Two New Products for 2017:

- • Corn BioYield 1: *Acceleron* B-300 SAT in the U.S. with global expansion opportunity
- • Soy BioYield 1: *Acceleron* B-200 SAT for soybeans in the U.S.