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2 | BASF Crop Protection

3 | BASF Plant Biotechnology

Dr. Peter Eckes
President, BASF Plant Science
The GM success story continues

Global GM crop area
in million hectares; 1 ha = 2.47 acres

Key facts
- Global GM crop area continued to grow in 2011 (8% from 2010)
- Biotech crops are planted on about 11% of the cultivated land
- In 2011, 16.7 million farmers grew GM crops in 29 countries
- Market expected to grow to €32 billion by 2020**

* CAGR 1997-2011
** Source: Context Outlook 2010, BASF estimates; incl. license value; major crops only; net farm value Source: ISAAA 2011
Americas as the growth driver for GM cultivation

Source: Clive James, ISAAA 2011
BASF Plant Science refocuses on strategic markets

Situation

Decision in January 2012
- Active portfolio & site management
- Strengthen position in North America; expand the new HQ in Research Triangle Park (NC)
- Stop projects with EU market focus
- Refocus activities on main markets in North and South America
- Consolidate global site footprint
- Trait Technology Partner Strategy remains unchanged
Cutting-edge trait technology platforms make us the ideal partner

The Best Traits…

- Unique technology platforms for yield screening, metabolite profiling
- Strong global academic network

…for the Best Seeds

- Strong partnerships with leading seed and food companies ensure optimal market access
## Cutting-edge trait technology platforms fuel strong pipeline

<table>
<thead>
<tr>
<th>Trait</th>
<th>Discovery</th>
<th>Stage I</th>
<th>Stage II</th>
<th>Stage III</th>
<th>Stage IV</th>
<th>Business potential</th>
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<tbody>
<tr>
<td></td>
<td>gene identification &amp; proof of concept</td>
<td>proof of concept in target crops</td>
<td>early product development</td>
<td>advanced product development</td>
<td>pre-launch</td>
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<tr>
<td>Yield &amp; Stress with Monsanto&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Drought-tolerant corn</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; Generation</td>
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<td>1&lt;sup&gt;st&lt;/sup&gt; Gen.</td>
<td>250-500 M $</td>
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<td>Higher-yielding corn</td>
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<td>Improved nitrogen utilization in corn</td>
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<td>250-500 M $</td>
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<td></td>
<td>Drought-tolerant cotton</td>
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<td>&lt;250 M $</td>
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<td></td>
<td>Higher-yielding soybean</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; Generation</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; Gen.</td>
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<td>250-500 M $</td>
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<td>Higher-yielding canola</td>
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<td>Higher-yielding wheat</td>
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<td>Yield &amp; Stress with others</td>
<td>Higher-yielding sugar cane&lt;sup&gt;2&lt;/sup&gt;</td>
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<td>Higher-yielding sugar beet&lt;sup&gt;3&lt;/sup&gt;</td>
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<td>Higher-yielding rice&lt;sup&gt;4&lt;/sup&gt;</td>
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<td>&lt;250 M $</td>
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<tr>
<td>Feed</td>
<td>Improved corn feed</td>
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<td>250-500 M $</td>
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<td>Specialities</td>
<td>Healthy fatty acids in canola&lt;sup&gt;5&lt;/sup&gt;</td>
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<td>tbd**</td>
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<td>Input Traits</td>
<td>Nematode resistant soybean&lt;sup&gt;1&lt;/sup&gt;</td>
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<td>&lt;250 M $</td>
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<td></td>
<td>Herbicide-tolerant soybean&lt;sup&gt;6&lt;/sup&gt;</td>
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<td>Fungal resistant soybean</td>
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### Target gross trait sales before partner share in 2020***: €1.8 bn

1. as communicated at Monsanto pipeline update in January 2012,
2. with CTC, 3. with KWS, 4. with Bayer, 5. with Cargill, 6. with Embrapa

* peak gross trait sales of last family member in country of 1st launch before partner share
** to be defined when product enters Phase II
*** adjusted due to discontinuation of potato projects
Launch of 1st commercial BASF/Monsanto product: DroughtGard™ Hybrids

System approach – germplasm, traits and agronomic recommendations

- DroughtGard™ Hybrids demonstrate enhanced hydroefficiency capability under drought stress
- Maintains top-end yield potential in well-watered conditions
- Advantage over competitor products under drought stress
- Completed ~250 Ground Breakers trials in 2012
- Full commercialization in 2013/14
The DroughtGard™ Hybrid – the first and only drought management system

Monsanto’s Ground Breakers
On-farm trial program designed to:
- Provide select farmers early exposure to the latest products and agronomic systems
- Support a better understanding of where, how and in which system a product will perform best
- Help support commercial decisions

DroughtGard™ Hybrid System
- ~250 Ground Breakers farmers on thousands of acres
- Stewardship guidelines followed throughout the unfolding of the regulatory approvals
- Targeted for the Western Corn Belt
The DroughtGard™ Hybrid System outperforms the competition

Drought-tolerant competitor product

DroughtGard Hybrids™

~5 bu/ac advantage in the 2012 field trials
Higher yielding rice: Biotech solutions tap an attractive and expanding market

Megatrend population increase
- Currently rice provides ~20% of human caloric intake globally*
- Current yield increase ~0.8% p.a. vs. future need of 1.2-1.5%*

Partner strategy
- Market access via non-exclusive license agreements
- First partnership signed with Bayer CropScience (#1 in global hybrid rice market)

Attractive market
- Yield increase offers an attractive value potential for combination of hybrid- & biotechnology
- Key markets: Asia and Americas

Higher yielding rice: First results show strength of yield trait system

Seed weight (indexed)

<table>
<thead>
<tr>
<th>TraitMill™</th>
<th>Indica Screen</th>
<th>Field Trail</th>
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<tbody>
<tr>
<td>Transgene</td>
<td>Reference</td>
<td>Transgene</td>
</tr>
</tbody>
</table>

Discovery

- japonica

Validation

- indica

Development

- indica
Where do our resistance genes come from?

The idea of Non-Host Resistance

- Soybeans, our host species, are highly susceptible to Asian Soybean Rust (ASR)
- There are plants with a natural immunity against ASR, like peanuts, chickpeas, certain clover and trefoil, etc.
- Non-Host Resistance relies on taking these resistance genes and introducing them into soybean
- Learning from nature enables an innovative biotech approach
Fungal-resistant soybeans: Innovation yields first promising results

Efficacy against ASR: 2012 field trials in Brazil

- Enhanced resistance*

- 100%
- 80%
- 60%
- 40%
- 20%
- 0%

- Lead gene 1
- Lead gene 2
- control

Fungal diseases have a major impact on soybean harvest

- Asian Soybean Rust (ASR) can result in yield losses of 10 to 90%

Objective:

- Provide broad, durable resistance against fungal diseases based on multiple genes
- Reliable insurance consisting of biotech trait & fungicide treatment
- Convenient system for easy use

Target market:

- South America, primarily Brazil (Total harvested area of 30 Mio ha potentially at risk of ASR damage)

* Best event

Resistance gene expressed

Susceptible mother variety
Summary and outlook

- Refocused on key markets in Americas and Asia
- Concentrate on highly attractive yield traits
- Discovery platforms enable innovative gene discovery
- Strong pipeline with target gross trait sales before partner share of €1.8 bn
- BASF Plant Science slated to become an operating division of BASF within this decade