

**Dr. Stefan Marcinowski**  
February 21, 2008

**More, better, faster!**  
**Emerging value in yield and stress**

 **BASF**  
The Chemical Company



# Drivers for agricultural market

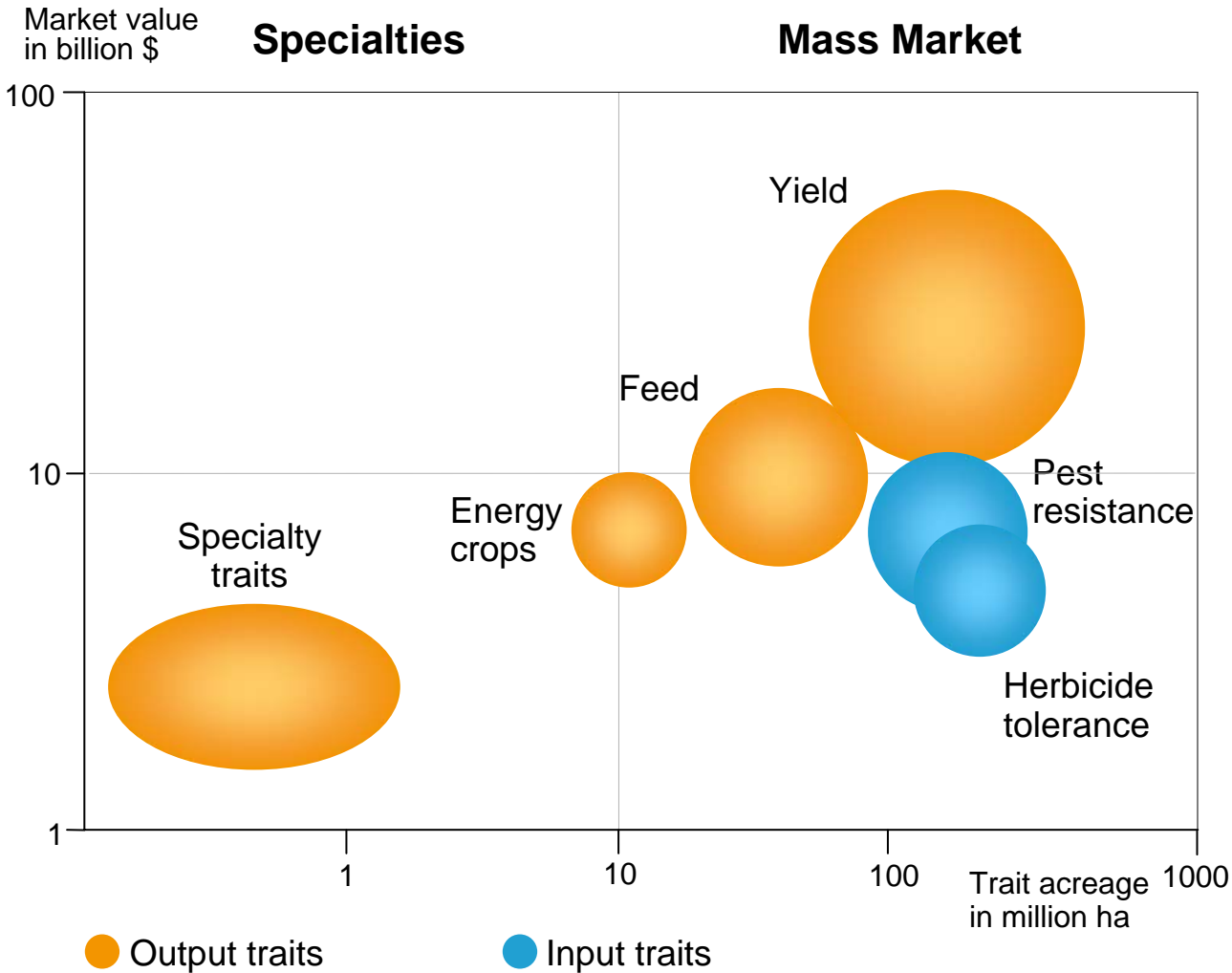
- **Food**  
Latest UN estimate on growing world population projects 9.2 billion people for 2050
- **Feed**  
Rising social standards drive global demand for more processed food, especially for meat consumption in Asia
- **Fiber**  
With 40% cotton is the single most important textile fiber in the world
- **Fuel**  
Use of agricultural commodities for fuel is growing by roughly 20% per year

## Actual situation:

- Global stocks of wheat and corn are at historical lows
- Commodity prices for main crops doubled from 2006 to 2007



# Global market for biotech traits in 2025



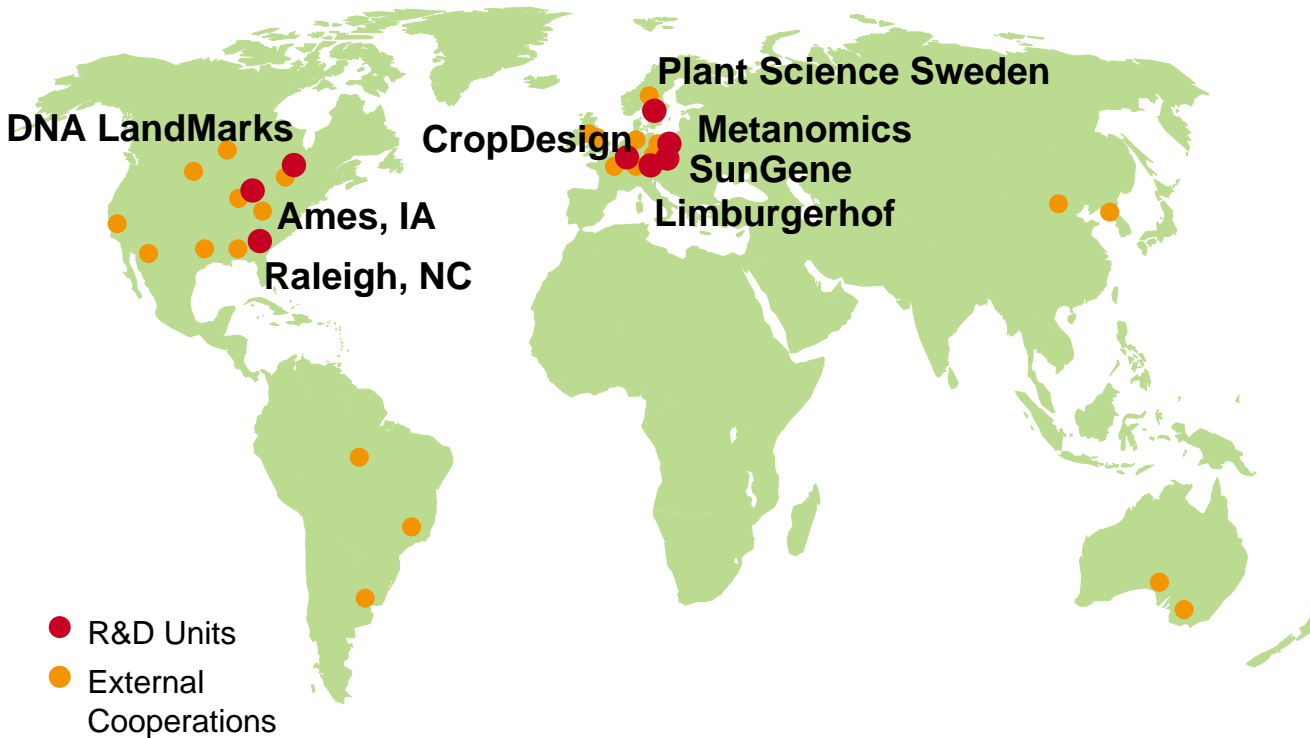
- Total projected market value for biotech traits in 2025 is estimated to \$50 billion
- Market is dominated by agronomic traits and commodities
- Yield is the major market



# Plant Biotechnology at BASF

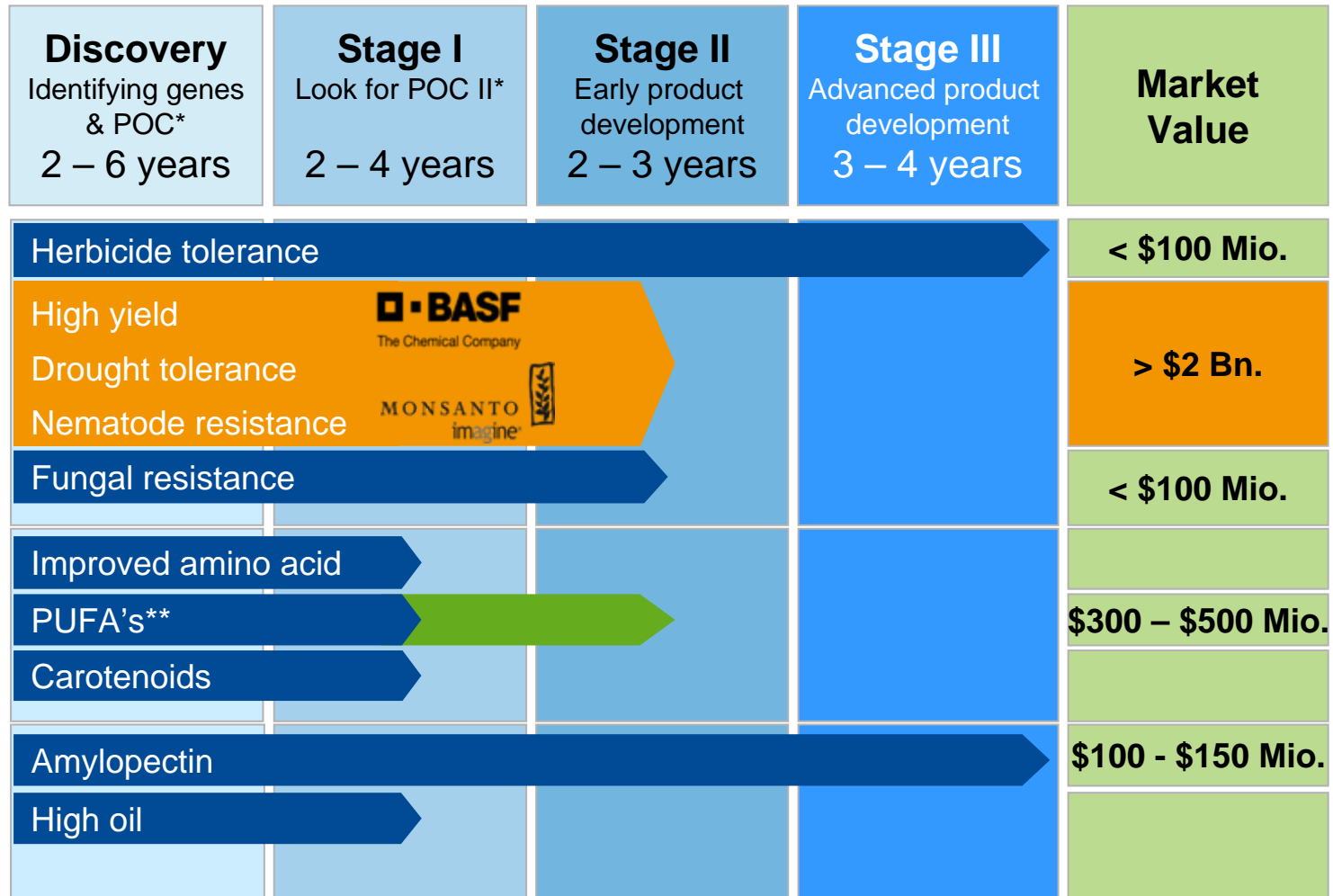
# Plant biotechnology at BASF – BASF Plant Science

**BASF Plant Science – global R&D network  
with 8 sites in 5 countries**



- Extraordinary bundling of diverse, innovative technologies
  - in-house developments
  - partnering with and founding of startups
  - acquisitions
- 700 employees in North America and EU
- 40 collaborations worldwide
- >150 external researchers
- Expenditures 1998-2008: €1 billion

# Strong early stage pipeline



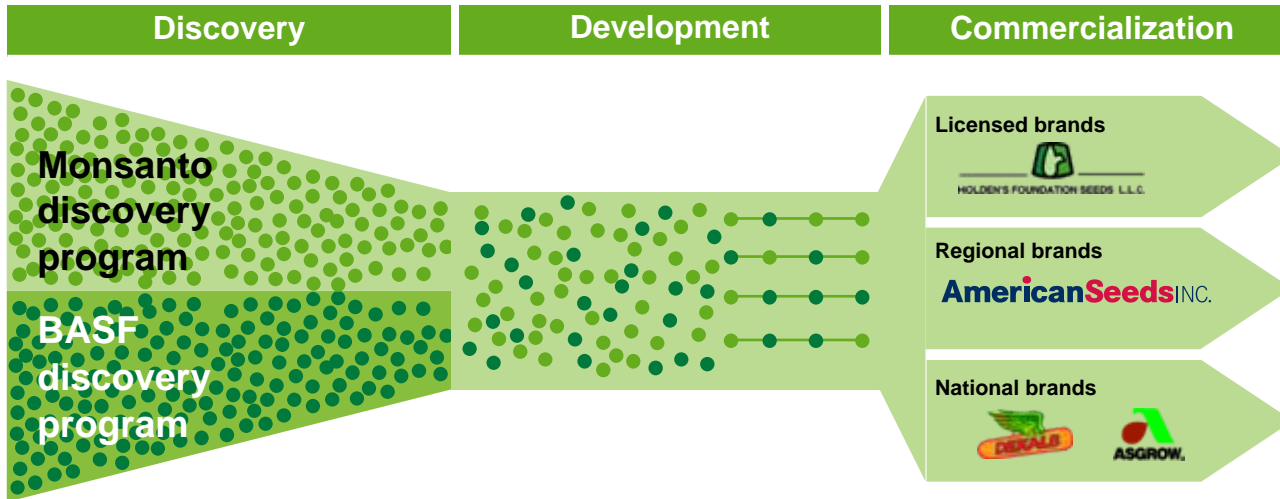
6 \* POC = 'Proof of Concept' in model crop / POC II: 'Proof of Concept in Target Crop' // \*\* PUFA = PolyUnsaturated Fatty Acids





## Collaboration with Monsanto

# Collaboration creates unified focus on yield



	Discovery	Development	Commercialization
Structure	<ul style="list-style-type: none"> <li>Maintaining independent discovery programs</li> <li>Projects nominated for development to jointly managed board</li> </ul>	<ul style="list-style-type: none"> <li>Jointly funded at 50/50</li> <li>Potential \$1.5/€1.2 billion R&amp;D budget</li> <li>Harnesses Monsanto's infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>Uses Monsanto's three commercial channels</li> <li>Value shared 60% Monsanto, 40% BASF</li> </ul>
Advantages	<ul style="list-style-type: none"> <li>Pairing of complementary discovery engines</li> <li>Increased rate of discovery</li> <li>Shorter early development timelines</li> </ul>	<ul style="list-style-type: none"> <li>Increasing probability of commercial success by greater volume of lead genes and cost sharing</li> <li>Speed-up steady stream of trait updates</li> </ul>	<ul style="list-style-type: none"> <li>Broad-licensing approach to seed companies allows for products to reach broadest market possible</li> </ul>

## Collaboration creates intensified yield & stress pipeline

- Step up volume of lead genes
- Develop stream of successive updates to create a 'family of products' in each crop
- Increase certainty of commercial success
- Focus on corn, soybeans, cotton and canola



# Progress of collaboration: the first eleven months

## Goals

- First product launch, drought tolerant corn, targeted 2012 onwards
- 6-10% yield increase per drought tolerant product generation

## Towards these goals ...

- BASF and Monsanto exchanged hundreds of gene constructs
- Significant increase of gene pool - less than 10% overlap between both parties' research programs
- Transformation in crops is ongoing at Monsanto – pipeline size increased by 33%
- Two projects advanced into the next stage



# BASF Monsanto collaboration

## Joint pipeline

	<b>Discovery</b> Identifying genes & POC*	<b>Stage I</b> Look for POC II*	<b>Stage II</b> Early product development	<b>Stage III**</b> Advanced product development	<b>Market Value 2020</b>
Drought Tolerant Corn Family	Drought Tolerant Corn				\$300 – \$500 Mio.
	2 <sup>nd</sup> Gen. Drought Tolerant Corn				
Nitrogen Utilization Corn Family	Nitrogen Utilization Corn				\$300 – \$500 Mio.
Broad-Acre Higher Yielding Corn Family	Higher Yielding Corn				> \$1 Bn.
Broad-Acre Higher Yielding Soybean Family	Higher Yielding Soybean				\$300 – \$500 Mio.
	2 <sup>nd</sup> Generation				

### Valuation metrics:

- Market value reflects annual gross sales value of trait in 2020 (~ farm gate level)
- Gross sales are presented for initial country of launch only
- Acreage opportunities reflect Monsanto's 2007 market penetration through the current channels
- Projects are valued as families

\* POC = 'Proof of Concept' in model crop / POC II: 'Proof of Concept in Target Crop'

\*\* Corresponds to Phase 3 and 4 in Monsanto's pipeline communication

# Hypothetical calculation example

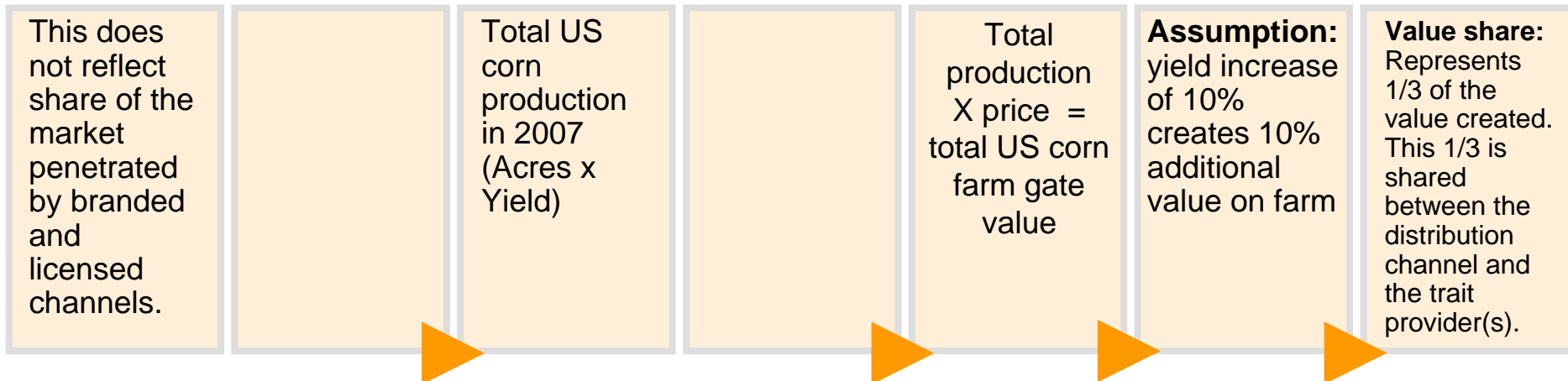
Figures US market 2007

Broad-acre higher yielding corn family

Harvested acres 2007 (million acres)	Yield 2007 (bushel/acre) 	Production 2007 (million bushel)	Farm price average 2007 (\$ / bushel)	Total farm value 2007 (million \$)	Trait value (10% yield increase in million \$)	Market value (trait value at farm gate level in million \$)
87	151	13,137	4.00	52,548	5,300	1,800

All data USDA (WASDE Report 11<sup>th</sup> 01 2008)

## Assumptions to be taken into account:



# Disclaimer

This presentation may contain forward-looking statements. These statements are based on current expectations, estimates and projections of BASF management and currently available information. They are not guarantees of future performance, involve certain risks and uncertainties that are difficult to predict and are based upon assumptions as to future events that may not prove to be accurate.

Many factors could cause the actual results, performance or achievements of BASF to be materially different from those that may be expressed or implied by such statements. Such factors include those discussed in BASF's Financial Report 2006 on pages 72ff. We do not assume any obligation to update the forward-looking statements contained in this presentation.



The Chemical Company



# Target crops of collaboration with Monsanto

## Trends in corn, soybean, cotton, canola



- Rising demand and prices for **corn** are driven by global bio-energy demand
- Yield increase is the only means to balance fuel vs. food & feed demand
- 35 million hectares biotech corn account for 30% of overall biotech crop acreage



- Processed **soybeans** are the world's largest source of protein and vegetable oil
- Biotech soybeans enjoy full regulatory acceptance in Argentina and Brazil
- 59 million hectares biotech soy account for > 50% of overall biotech crop acreage



- **Cotton** accounts for about 40% of all textile fibers produced
- Long term profitability requires yield increase to offset rising production costs
- 15 million hectares biotech cotton account for >13% of overall biotech crop acreage



- Bio-diesel demand is driving the price of **rape** oil
- Rape oil has started to follow the crude oil market more closely
- 6 million hectares biotech canola account for 5% of overall biotech crop acreage