Monsanto and Renessen’s pipeline products

Scientific hearing with Applicants - Scientific panel on Genetically Modified Organisms
March 21st, 2007

Bruno Tinland
Monsanto Company
Second Generation of Biotech Crops

- Farmer
- Drought
- Nitrogen
- Yield
- Fortified Food
- Healthy Oils
- Insect/Virus Protection
- Herbicide Tolerance
- Consumer
- Processor
- Biofuel
- Feed Enhanced
- Industrial Processes

First Generation of Biotech

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We Address Challenges One Phase at a Time, Beginning With Discovery

<table>
<thead>
<tr>
<th>Phase</th>
<th>Gene/Trait Identification</th>
<th>Proof Of Concept</th>
<th>Early Development</th>
<th>Advanced Development</th>
<th>Pre-launch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>24 to 48 MONTHS</td>
<td>12 to 24 MONTHS</td>
<td>12 to 24 MONTHS</td>
<td>12 to 24 MONTHS</td>
<td>12 to 36 MONTHS</td>
</tr>
<tr>
<td>Spending</td>
<td>$2-5M</td>
<td>$5-10M</td>
<td>$10-15M</td>
<td>$15-30M</td>
<td>$20-40M</td>
</tr>
<tr>
<td>Probability</td>
<td>5 PERCENT</td>
<td>25 PERCENT</td>
<td>50 PERCENT</td>
<td>75 PERCENT</td>
<td>90 PERCENT</td>
</tr>
<tr>
<td>Key Activity</td>
<td>• HIGH-THROUGHPUT SCREENING • GENE OPTIMIZATION • CROP OPTIMIZATION • MODEL CROP TESTING</td>
<td>• TRAIT DEVELOPMENT • PRE-REGULATORY DATA • LARGE-SCALE TRANSFORMATION</td>
<td>• TRAIT INTEGRATION • FIELD TESTING • REGULATORY DATA GENERATION</td>
<td>• REGULATORY SUBMISSION • SEED BULK-UP • PRE-MARKETING</td>
<td></td>
</tr>
</tbody>
</table>

1) Time estimates are based on our experience; they can overlap. Total development time for any particular product may be shorter or longer than the time estimated here.

2) This is the estimated average probability that the traits will ultimately become commercial products, based on our experience. These probabilities may change over time.

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Second Generation of Biotech Crops

Farmer benefits

Drought
Nitrogen
Yield

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Overcoming Insufficient Fresh Water for Crop Usage

Drought Tolerant Corn

- Yield enhancement demonstrated again in 2006 under water-stress conditions in U.S.
- Lead event chosen
- 2007 trials expected to demonstrate yield enhancement in multiple hybrids under dryland conditions

2006 Testing:
Yield Improvement of Lead Event Under Drought Stress

<table>
<thead>
<tr>
<th>Year</th>
<th>HYBRID 1</th>
<th>HYBRID 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>7.3%</td>
<td>0%</td>
</tr>
<tr>
<td>2005</td>
<td>10.5%</td>
<td>0.9%</td>
</tr>
<tr>
<td>2006</td>
<td>10.9%</td>
<td>23.2%</td>
</tr>
</tbody>
</table>

In third year field testing in U.S., drought-tolerant leads are consistently delivering higher yields compared with controls under drought-stressed conditions.
Overcoming Insufficient Fresh Water for Crop Usage

Drought Tolerant Cotton

- Drought leads advancing to greenhouse screens
- First leads in field testing are showing promise
- Up next: Continued evaluation to assess drought performance

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Building Yield Enhancement By Using Nitrogen Efficiently

Nitrogen Utilization Corn Update

- Industrial scale genomic efforts are generating leads
- Lead events show roughly 10% yield increase in multi-location field trials under limiting nitrogen
- Up Next: Optimization to improve trait performance and continued screening

These 2 events show no yield drop off as the Nitrogen application levels decrease from 180 lbs/ac to 40 lbs/ac

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With Three Years of Field Data, Higher-Yielding Corn Exits Proof-of-Concept for Phase 2 Development

- In 2006 field testing, lead event shows yield efficacy in different test hybrids
- 3 years of data demonstrate yield increase in multi-location trials with multiple hybrid combinations
- Commercial transformations will be made, with further testing to select for lead events

2006 TESTING: 2006 Field Results Indicate Increased Yield Versus Conventional Checks

<table>
<thead>
<tr>
<th>Product Concept</th>
<th>Target Range</th>
<th>HYBRID 1</th>
<th>HYBRID 2</th>
<th>HYBRID 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>12.1 bu/ac</td>
<td>13.7 bu/ac</td>
<td>15.5 bu/ac</td>
</tr>
</tbody>
</table>

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Consumer benefits

Fortified Food

Healthier Oils

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First Generation of Biotech

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Increasing Omega-3 for Health Benefits

Omega-3 & CHD Mortality

- USA
- Spain
- Japan
- Greenland

Chd deaths per 100,000

Omega-3 in diet

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Omega-3 Soybeans Have Met Early Development Targets for Food Application and Field Performance

**Omega-3 Soybeans**

- Represents a land-based supply of essential Omega-3 fatty acids
- With soybean oil that would contain 20% stearidonic acid, the intent is for taste, shelf-life and oil stability to be as close to soybean oil as possible

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(10 Locations)</td>
<td>(12 Locations)</td>
<td>(15 Locations)</td>
<td>(12 Locations)</td>
<td>(16 Locations)</td>
</tr>
<tr>
<td>OMEGA-3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONTROL</td>
<td></td>
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</tbody>
</table>

Over 5 growing seasons and 65 locations, no significant yield differences between the Omega-3 lead event and control

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Reducing Trans Fats for Health Benefits

- Reduce/eliminate trans fats with increased oil stability, requiring less hydrogenation
- Achieve yield parity and stack with Roundup Ready® trait
- Reduce linolenic acid to <3%
- Launched in 2005

<table>
<thead>
<tr>
<th>Vistive™</th>
<th>a better soybean oil, naturally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Soybean</td>
<td>Linolenic 18:3</td>
</tr>
<tr>
<td>Vistive 1 - Low Lin</td>
<td>Linoleic 18:2</td>
</tr>
<tr>
<td>Vistive 2 - Low Lin - Mid Oleic</td>
<td>Oleic 18:1</td>
</tr>
<tr>
<td>Vistive 3 - LL - MO - Low Sat</td>
<td>Sats 18:0 / 16:0</td>
</tr>
</tbody>
</table>

Note: Appearing on product labels as of January 2006

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Vistive III Soybeans Continue to Meet Oil Composition and Yield Targets for Commercial Development

Vistive III Soybeans

- Designed to lower linolenic and saturate content, while boosting oleic content
- Phase 2 oil traits testing focuses on replicating oil-profile targets
- 2006 testing allowed for lead selection with multiple events hitting oil-profile targets

<table>
<thead>
<tr>
<th>2006 TESTING: Lead Events With Target Oil Composition Identified</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>% FATTY ACID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oleic Acid</td>
</tr>
<tr>
<td>Saturates</td>
</tr>
</tbody>
</table>

In 2006 field testing, multiple events met target composition of 55-75% oleic and <7% saturates. Selection of leads is actively under way.

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Enhancing Essential Amino Acids in Feed

Mavera™ High Value Corn With Lysine

- Enhance level of limiting essential amino acids and corn oil content in feed
- Lower cost of animal feed ration
- Improve amino acid balance
- Increase total energy

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Enhancing Oil Yield for Grain Processing

High Oil Soybeans for Processing

2006 Testing:
Multi-Year Testing for Higher Oil Content

• Targeted to increase total product offering by improving crushing yield and meal protein content

• In 4 seasons of testing, significant oil yield advantage has been shown with high-oil gene

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Future Products

*Commercialization dependent on many factors, including successful conclusion of regulatory process

Ressen is a Monsanto/Cargill joint venture

Feed: 2nd Gen. high-value corn with lysine*

Feed: High Protein Soy*

Roundup® Ready Flex

Soy Protein

YGVT PRO Stacks

High Stearate

BG3

Processing: High Oil Soy*

Feeding: HVS*

Dicamba

Yield I

Drought I

Cold

CORN

OILSEEDS

COTTON

Mavera high-value corn with lysine*

Yield II

Drought II

Disease

SCN

Feed: 2nd Gen. high-value corn with lysine*

Feed: 2nd Gen. high-value corn with lysine*

Feed: 2nd Gen. high-value corn with lysine*

Feed: 2nd Gen. high-value corn with lysine*

Feeding: High Protein Soy*

Soy Protein

OmniSoy

CRWIII

BG3

HBC a”

RR2Y

Yield I

RHS Canola

RR2+ Yield

Modified Oil Canola

Drought I

Disease

Lygus

Nitrogen

Water usage efficiency

*Commercialization dependent on many factors, including successful conclusion of regulatory process

* Ressen is a Monsanto/Cargill joint venture

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