



Multi-client study prospectus

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2008 Edition

**Plant Biotech Traits**

**Commercialized: Outlook 2015**

*Where and how will the next wave of Plant Biotech Traits influence the marketplace?*

*What traits will be included in the next wave of plant biotech trait innovation?*

*What geographies will be first to see the introduction of these new traits?*

*How will the introduction of plant biotech traits in China and India influence the more developed markets of U.S. and Europe?*

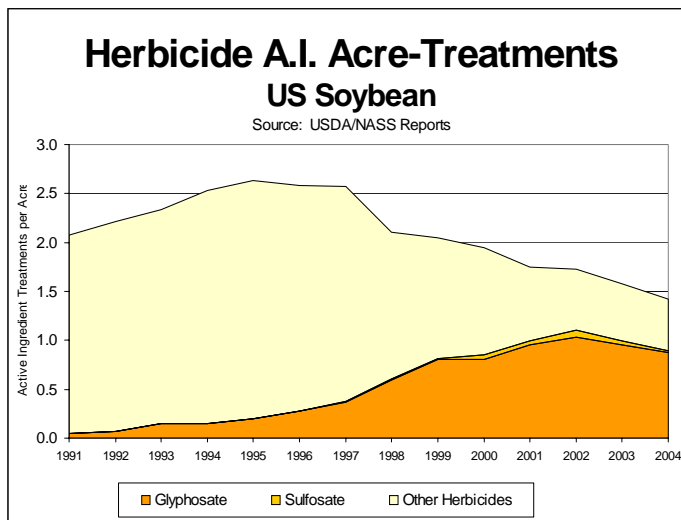
*Who is likely to benefit the most from these traits and how will they benefit?*

*What skills and competencies will be most critical for success in the plant biotech trait business during the next decade?*

## Introduction

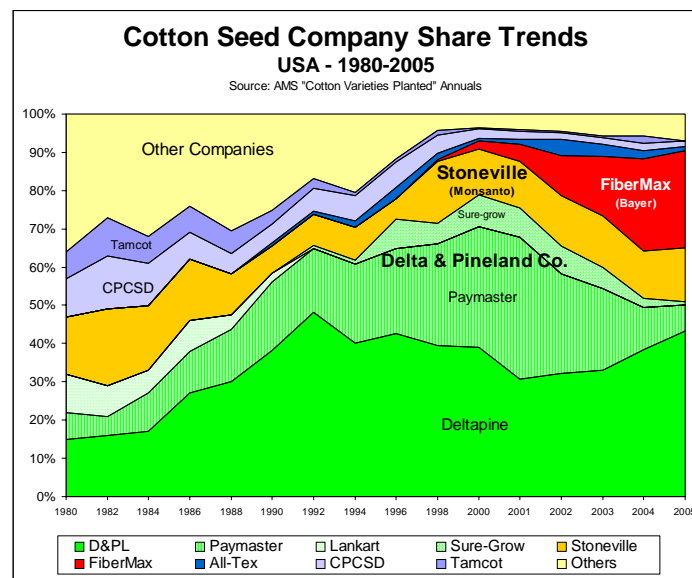
Since the introduction of biotechnology traits in 1995, effected crops have experienced dramatic alterations. Many of the companies leading the introduction of these biotechnology traits have significantly improved their position in the marketplace, while others have fallen by the wayside. Context Network's Biotech Traits Commercialized study captures the broader business and technology trends and shows how specific traits have changed the business landscape for each crop. Examples include:

- *Bayer and its predecessor companies had very little position in the Canadian canola industry prior to the introduction of hybrid Liberty Link canola. They now enjoy a 41% share of this market.*

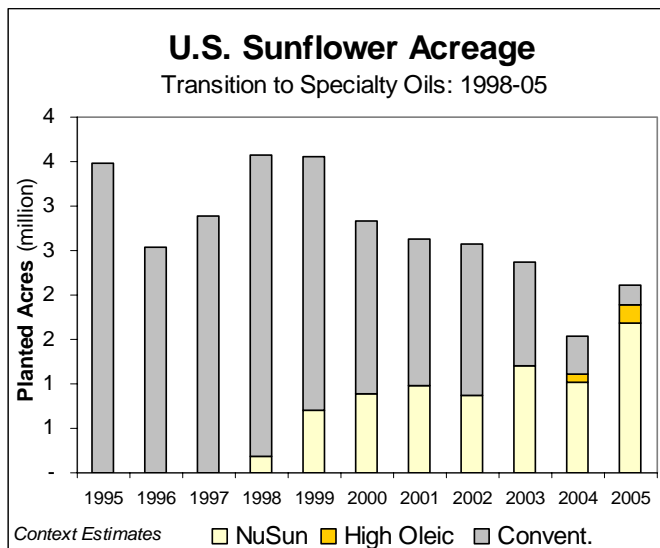


- *The dramatic shift in the weed control market, from traditional herbicides to Roundup Ready technology, is legendary, as is Monsanto's current market share in corn and soybeans.*
- *The adoption of European corn borer resistance in U.S. field corn helped create a sizeable insect control market.*

- *Although not transgenic in nature, quality traits in cotton have created a completely new market niche for a new brand, decreasing the once seemingly impenetrable market share of Delta Pine and Land Company.*



## Introduction (con't.)

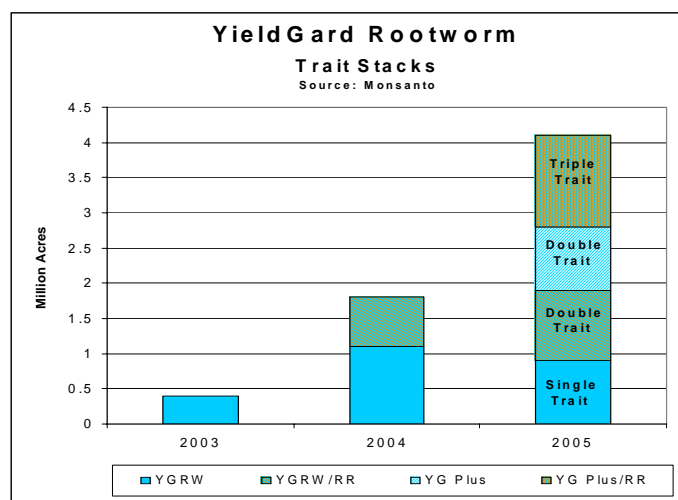


- Introduction of non-transgenic NuSun mid-oleic sunflower oil has changed an entire commodity market in North America.

In addition to market share changes and commercialization of new products, there has been a change in required critical success factors. Differences among companies in this regard have been instrumental in their success as measured by market share and profitability. For example:

- The ability to create and develop new value capture systems is now not only an essential element of success; it represents a key competitive advantage.
- The ability to influence public acceptance of new technologies has moved from a role of somewhat minor importance within a communications group to a critical component of new product development and introduction.
- The ability to rapidly introgress traits into the current elite germplasm now rivals the creation of new genetic lines in importance.
- Excellence in obtaining regulatory approvals is essential.

- *It is increasingly evident that the first wave of biotechnology traits is nearing its peak in terms of market penetration and customer use. For this first wave of traits, the ability to rapidly stack traits in elite germplasm is the key to business success.*



## Introduction (con't.)

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Since 1995, The Context Network's comprehensive, multi-client study, *Biotechnology Traits Commercialized*, has helped businesses track and forecast industry changes. Industry leaders and analysts have used the study to measure success, anticipate key business and technology trends, and identify growth opportunities.

While tracking developments and associated commercial activities for current traits continues to be valuable, it is increasingly important to turn our focus to future traits. The global market impact of future traits is an essential element of the 2008 edition of our study.

In addition to coverage of traits developed and commercialized through 2007, the 2008 edition of **Plant Biotech Traits Commercialized: Outlook 2015** provides additional focus and insight on the traits, crops and technologies likely to be introduced through 2015.

## About the Study

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The 2008 edition of **Plant Biotech Traits Commercialized: Outlook 2015** consists of two parts.

**Part I** reviews previously commercialized traits and focuses on anticipated market developments and changes in technology. It covers key traits currently marketed in the eight major crops shown below:

Types of Traits	Corn	Soybeans	Canola	Sunflower	Alfalfa	Wheat	Rice	Cotton
Insecticidal	Coleopteran Bt							
	Lepidopteran Bt							Lepidopteran Bt
Herbicide Tolerance	Glyphosate Tolerance	Glyphosate Tolerance	Glyphosate Tolerance		Glyphosate Tolerance			Glyphosate Tolerance
	Glufosinate Tolerance		Glufosinate Tolerance					Glufosinate Tolerance
			Imidazolinone Tolerance	Imidazolinone Tolerance		Imidazolinone Tolerance	Imidazolinone Tolerance	
Output		Low Linoleic Acid						
								Premium Quality Fiber

The detailed coverage in Part I is primarily commercial in nature and includes comments on value capture methods and other marketing programs, as well as past and expected performance of the trait.

**Part II** provides an outlook for traits in development but not yet commercialized. Over two dozen traits in eleven different fruit, vegetable, oilseed and grain crops are explored. Traits with the largest market potential and highest probability of success are described, as are those that are still early the development cycle. Technical, commercial, market, regulatory and intellectual property issues are discussed.

The scope of the study has been expanded to include traits for new crops in an increased number of countries and regions.

Although each trait in this section will be reviewed, due to the speed of development of these traits, many sections will appear in a form similar to the 2007 report; any changes in development or commercialization plans will be clearly noted.

## New Feature

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As an additional feature this year, we are including two detailed sections describing the possible effects of two new technologies/traits. These new sections provide more detailed coverage than in previous versions of the study. They have been included because of their potential to affect the broader marketplace.

### Specialty Oils

This will be an in-depth look at new developments in the increasingly important specialty oils business. Areas of focus will include advances in technology (biotechnology, genetics, plant breeding), potential new products, market opportunities, regulatory changes and the possible impact of new technologies and products on the specialty oils business. Special attention will be paid to the industry's competitive landscape and future trends.

Broad knowledge of the industry will be combined with careful analysis to provide the basis for a study that presents a unique perspective and understanding of the specialty oils business. This comprehensive, multi-client study will be useful not only to firms directly involved in specialty oils, but to those in closely associated industries, such as transportation and food. Industry leaders and analysts have used the study to measure success, anticipate key business and technology trends and identify growth opportunities.

### N-Utilization

This will be a detailed analysis of a trait that could have far-reaching implications throughout agriculture. In addition to describing advances in corn, the potential of this technology in other crops will be discussed. Implications from an environmental, as well as economic, perspective will be described. Technical, regulatory and commercial timelines and expectations will be examined.

In developing this study, Context Network will rely on industry knowledge developed through contacts with a broad array of technical, commercial and regulatory experts. A combination of these inputs with careful, deliberate analysis will serve as the foundation for the unique perspective this study will provide to any organization, business or individual with an interest in this important technology and its potential impact on agriculture.

## Study Outline

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### Part I

Part I covers 17 previously commercialized traits commercialized in eight crops. Topics covered include:

- I. Trait Summary
- II. Trait History
- III. Market Participants
  - A. Traits
  - B. Germplasm
- IV. Trait Description
  - A. Mode of action
  - B. Intellectual property/ patents
- V. Regulatory Approvals
- VI. Trait Efficacy
  - A. Crop tolerance
  - B. Major targets
  - C. Environmental issues
  - D. Field management
- VII. Economics
  - A. Trait providers
  - B. Seed companies
- VIII. Long Term Outlook & Future Products
- IX. International Markets
  - A. Regulatory environment by country
  - B. Market environment by country
  - C. Outlook

## Study Outline (con't.)

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### Part II

Part II covers 24 traits under development in 11 fruit, vegetable, oilseed and grain crops. The range of traits covered includes agronomic and output traits. Examples of the traits nearing commercialization by 2015 and covered in this section are shown in the chart at right. A complete trait review is provided for eight of the 24 traits. The remaining 16 are covered in summary fashion.

Topics covered in a **full trait review** are:

- Trait description
- Technical overview
- Commercial need and market potential
- Technical description
- Potential introduction date
- Companies working on development of the trait
- Expected trait efficacy
- Expected economics
- Intellectual property/FTO issues
- Regulatory issues
- Public acceptance issues
- Technical probability of success within two years of target date of introduction
- Probability of commercial introduction within two years of target date

Topics covered in a **summary trait review** are:

- Trait description
- Technical overview
- Commercial need and market potential
- Potential introduction date
- Companies working on development of the trait
- Technical probability of success within two years of target date of introduction
- Probability of commercial introduction within two years of target date

#### Part II will include traits such as:

- **Modified Oil in Canola and Soybeans**
- **Drought Tolerance in Corn and Wheat**
- **Nitrogen Use in Corn**
- **Nematode Resistance**
- **Disease Resistant Papaya**
- **Vitamin Enriched Rice**
- **Insect and Disease Resistant Rice**
- **Dicamba Tolerant Soybeans**
- **Omega 3 Soybeans**
- **Insect Resistant Soybeans**
- **Roundup Ready Soybeans with Yield**
- **Insect Tolerant Apples**
- **Disease Resistant Potatoes**
- **Altered Starch in Potatoes and Corn**
- **Insect Tolerant Eggplant**

## Why This Study?

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The 2008 edition of **Plant Biotech Traits Commercialized: Outlook 2015** focuses on the traits, crops and technologies that are likely to be introduced between now and 2015. This enhanced focus will inform and update subscribers regarding the marketplace for existing traits and provide enhanced insight into the opportunities and challenges new biotechnology traits will bring to the marketplace. This unique study provides a valuable perspective to those seeking to chart a course that will lead to future business success.

## Who Should Subscribe?

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All companies, groups or individuals interested in the development and commercialization of agricultural biotechnology products should subscribe. This includes representatives of financial institutions, business analysts and advisors, biotechnology companies, food companies, energy companies, transportation firms, large agricultural enterprises, plant fertility and nutrition firms, companies engaged in animal agriculture, legal and regulatory professionals and firms involved in the wholesale and/or retail distribution and sale of these products.

This report is especially valuable to senior executives, individual responsible for strategic planning and business development professionals who are involved in preparing and planning for the future of companies involved in agriculture.

## Project Schedule and Deliverables

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Copies of the study will be available in March 2008.

Context will deliver copies of the final study in an electronic document format, including a PowerPoint presentation (CD, DVD or mini-drive). If desired, paper copies are also available upon request.

**Upon request, the report also includes a Context tele- or videoconference presentation. Customized, in-person presentations are available for an additional fee.**

## Project Team

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As with all multi-client studies from The Context Network, this study will be completed by a team of individuals who know the specific industry and topics that they are researching. A selection of the researchers and reviewers that will be involved follows.

**Dr. Alison Morgan (Researcher and Author)** has over 20 years experience in the biotechnology industry, and five years consulting with The Context Network. She has broad experience in project management, matrix management of interdisciplinary teams, and business and product development. She has a strong technical background in plant physiology, molecular biology and genomics, is skilled in technical assessment, and in providing the interface between business and science. Dr. Morgan holds a B.S. in Biological Sciences from the University of Birmingham, England and a Ph.D. in plant cell biology from the University of Nottingham, England.

**Dr. Paul Christensen (Researcher and Author)** has applied his education to developing new variety evaluation and commercialization systems, world-wide. His unique background in global seed business includes the development of products and businesses in new and established markets. Dr. Christensen served as a Product Evaluation Manager with DEKALB Genetics Corporation, providing technical product and market development services for Latin America, Eastern Europe and Africa. Dr. Christensen also served as Manager International Biotech Regulatory Affairs for DEKALB. As Technical Product Manager for Monsanto Company, he coordinated regulatory approval for seed use of DEKALB transgenics outside the US and oversaw a group of small, but profitable, markets in Asia. He currently serves as a program manager of the Seed Science, Technology and Business Management Masters Program, Iowa State University.

**Mark Nelson (Researcher and Author)** has a uniquely blended background of industry and academic experience within agriculture. His agribusiness research and operations planning experience brought him to The Context Network in the fall of 2001. Mr. Nelson began his career in agribusiness with Pioneer Hi-Bred, a DuPont company, as an analyst in the Supply Management Department. He was the primary analyst responsible for developing and coordinating production plans for world-wide alfalfa and sorghum production. Later at Pioneer, he received training in Six Sigma methodologies and served as a Black Belt (project manager) for several process improvement projects, achieving full implementation of team recommendations during his tenure. Mr. Nelson has also served as a program associate at the Cornell Program of Dairy Markets and Policy, Cornell University.

**Thomas B. Klevorn, Ph.D. (Researcher and Author)** has more than 20 years of leadership and business experience in pharmaceutical and agricultural life science businesses and focuses on helping clients turn scientific and technical innovations into sustainable business results. He has served as Head, NK Brand for Syngenta, as well as heading up their Corn & Soybean Plant Science Business Units. Klevorn's career has also included serving as Co-head of Agricultural Business, Monsanto do Brazil and Director of Mergers and Acquisitions for Monsanto.

**Mike Harwood (Researcher and Author)** has specialized in agricultural biotechnology business development as a senior manager in several start-up companies and as a consultant and university lecturer. He is skilled in the creative integration of wide-ranging scientific, technical, marketing and financial data during the process of business strategy analysis. Broad international experience in the seeds, agricultural chemicals and food industries has been accumulated over a thirty-year period.

**Blake Sieker (Reviewer), Partner**, has been involved in business finance and strategy development for the past 20 years. He has a unique background in the agribusiness sector in that he has worked in management in both the domestic and international groups of Garst/Zeneca and has worked in both the financial and market development areas of this international business. In addition, he was the chief financial officer responsible for strategic planning, reporting, and debt and equity financing for the aggressive development strategies of a large regional seed company. Sieker has managed over 100 proprietary financial and strategic projects for Context since 1997.

**Steve Hawkins (Reviewer), Partner**, has over 30 years experience in the seed and biotechnology industry with 20 years at Asgrow Seed Co. in various operations, marketing and business development areas. He served as President and Chief Operation Officer of Delta and Pine Land Company, the leader in cotton seed and cotton seed technologies, for five years. He also has served as Chairman and President of a start-up agricultural biotechnology company and was a sole proprietor of a consulting business targeted to agriculture prior to joining The Context Network.

**Tray Thomas (Reviewer), Founding Partner**, has focused his career on assisting companies in discerning the changing face of agribusiness in order to formulate and implement strategies that will effectively utilize their resources. Prior to founding The Context Network, Mr. Thomas gained first hand experience in commercializing new agricultural products and technologies within the rapidly changing agricultural market, both as a professional management consultant with Arthur D. Little, Inc., and an executive with ICI's Global Seed Division. The bulk of his experience has been in the agricultural chemical, agricultural biotechnology, and seed industries.

## About Context

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The Context Network provides business management consulting services to the world's leading agriculture, biotechnology and food companies, as well as government agencies. The firm is composed of a core of professional consultants, complemented by an extensive network of industry and subject area experts. Other recent multi-client reports offered by Context include:

- Global Seed Market Database
- Seed Market Forecast
- Benchmarking Study for Crop Protection Manufacturers in North America
- The Future of the North American Biofuels Industry

## Investment

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The purchase price of **Plant Biotech Traits Commercialized: Outlook 2015** is \$47,500. One half of the purchase price will be invoiced upon receipt of this form by The Context Network, with the second half to be invoiced upon delivery of the report. All invoices are due upon receipt. Invoice scheduling can be adjusted if needed to fit client budgeting requirements. Discounts are available for those who purchase more than one multi-client report from The Context Network.

## Order Form

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To subscribe to **Plant Biotech Traits Commercialized: Outlook 2015**, please read and agree to the following statement:

*To protect our investment in this report and that of other subscribers, we agree to keep confidential the study results within our company. We may make this report available to any subsidiary company in which we hold more than 50% interest or to a parent company that holds more than 50 % interest in our firm. We understand that we may use or disclose any information in this report that is public knowledge or that was in our possession before receipt of the study, or that comes to us from third parties independently of this report.*

### **Please enter my order for the study at a price of \$47,500**

I understand that I will be invoiced for one half of the price upon receipt of this form by The Context Network, that I will be invoiced for the second half upon delivery of the reports, and that all invoices are due upon receipt. *Invoice scheduling can be adjusted if needed to fit client budgeting requirements.*

Company \_\_\_\_\_ Date \_\_\_\_\_  
Name \_\_\_\_\_  
Signature \_\_\_\_\_  
Telephone \_\_\_\_\_  
E-mail address \_\_\_\_\_

Please sign this agreement and return to:

The Context Network  
1501 42<sup>nd</sup> St., Suite 472  
West Des Moines, IA 50266

Phone: 515/225-2204  
Fax: 515/225-0039  
Email: [joanne.powers@contextnet.com](mailto:joanne.powers@contextnet.com)



# CONTEXT

The Context Network  
1501 42<sup>nd</sup> St., Suite 472  
West Des Moines, IA 50266  
515-225-2204  
[www.contextnet.com](http://www.contextnet.com)