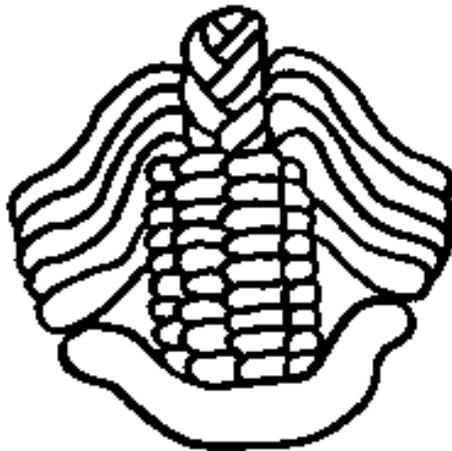


# Sun Dance Genetics



**April 2002**

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Field test with artificial infestation of 1400 Western corn rootworm eggs per foot of row. Rootworm resistant Sun Dance hybrids in the top row compared to corn in the bottom row. Conducted at the USDA Northern Grain Insects Research facility, Brookings, SD, 1999.

## **EXECUTIVE SUMMARY**

### **Concept and Opportunity**

Sun Dance Genetics develops improved corn germplasm using conventional plant breeding methods. The technology is a proprietary genetic bridge for transferring beneficial traits into corn that overcomes obstacles previously thought insurmountable.<sup>1</sup> Royalty-bearing licensing agreements will be entered into with seed producers for production of commercial hybrid seed using Sun Dance germplasm that carries traits such as pest resistance and drought tolerance. Since 1989, five patents have been awarded on Dr. Eubanks' novel gamagrass-teosinte hybrids and hybrid corn lines. A sixth United States patent and international patent applications are pending. These patents are solely owned by Sun Dance Genetics and no other parties have any claim on them. This platform technology will allow us to develop an array of corn seed products with desirable traits. This proprietary method is an unprecedented conventional approach to confer valuable traits to corn for which there is a large market, but no comparable rival technologies.

### **Product Description**

Sun Dance Genetics' platform technology permits the transfer of numerous beneficial traits from wild relatives into corn. These traits include pest resistance, drought resistance, cold tolerance, improved yield, enhanced grain quality and many other desirable traits.<sup>2</sup> Sun Dance is breeding traits into elite inbred lines that will be marketed when uniform expression of a trait has been exhibited in field trials. This germplasm will then be licensed to seed producers for introduction into their own lines. Two initial traits currently in the Sun Dance Genetics pipeline are corn rootworm resistance and drought tolerance. Rootworm is worst insect pest of corn in the U.S., costing farmers \$1.2 billion each year.<sup>3</sup> Drought is the single most limiting factor in world maize production.<sup>4</sup> These two traits are the first of many products that Sun Dance Genetics will develop using this novel, patented genetic bridge technology.

Benefits of Sun Dance Genetics technology include:

- (1) A platform to transfer an array of genes and traits into corn products;
- (2) Identification of new traits for pest resistance and environmental stress tolerance;
- (3) Increased crop yield;
- (4) Traditional breeding methods sidesteps government regulatory hurdles of GMO crops;
- (5) Conventional breeding methods that lower production costs;
- (6) Provides an environmentally safe alternative to pesticides;
- (7) It provides continuous crop protection;
- (8) Will add new tools for insect management strategies and crop improvement;
- (9) Identify traits that could be moved into many other crops via genetic engineering.

Dr. Eubanks' patents provide a solid intellectual property (IP) portfolio. Sun Dance Genetics seeks to out-license this technology in order to concentrate on developing further traits as an ongoing pipeline of opportunities.

### **The Market**

Corn is grown in more countries than any other crop. Annual world corn production in 2000 was 23 billion bushels, which translates to approximately \$50 billion at the farm gate. The United States produces 43% of the global crop. China is the next largest grower with 18% of world production. Other

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<sup>1</sup> Eubanks, Mary. "The Mysterious Origin of Maize." *Economic Botany* 55:492-514 (2001).

<sup>2</sup> Eubanks, M.W. "Tapping Ancestral Genes in Plant Breeding." *Ethnobiology and Biocultural Diversity*. University of Georgia Press. pgs. 225-238 2002.

<sup>3</sup> Lee, Thomas "Corn rootworm resistant corn moves closer to market." *St Louis Post-Dispatch*. July 23, 2001 [http://www.biotech-info.net/closer\\_to\\_market.html](http://www.biotech-info.net/closer_to_market.html)

<sup>4</sup> Appendix II – Letter from Novartis' Director Special Traits Research

large producers include the European Union (7%), Brazil (6%), Mexico (3%), Argentina (3%), and India (2%). The Pacific Rim region in Asia is the world's fastest growing emerging market for U.S. corn exports. According to the American Seed Trade Association, over the next 25 years, world demand for cereal grains will increase by 55%.<sup>5</sup> The large global market for corn seed will continue to expand as human population increases and new products from corn derivatives are developed. As the number one crop in the United States, the value of corn at the farm gate ranges from \$20 to \$30 billion a year.<sup>6</sup> Around 80 million acres are planted in corn annually. This platform technology will provide a variety of new traits for corn improvement that will target all segments of the market.

One initial product, *Rpr*<sup>TM</sup>, targets the \$1.2 billion U. S. corn rootworm problem. The total U.S. market potential for rootworm resistant seed sales is estimated to be more than \$600 million.<sup>7</sup> Based on highly conservative estimates, Sun Dance projects that within five years on the market we will be able to achieve revenues of \$60 million annually from this *Rpr*<sup>TM</sup> product alone.<sup>8</sup> This market is ripe for innovation related to rootworm resistance because rootworms are developing resistance to current insect management practices including insecticides and crop rotation. According to the Illinois Department of Natural Resources, western corn rootworms have developed a 1,000-fold increase in resistance to most insecticides.<sup>9</sup> Our non-genetically engineered product will also have broad customer acceptance because no regulatory compliance is required.

Since Sun Dance Genetics seeks to license its technology for commercial production, our customers will be seed companies. The three largest seed producing companies, DuPont-Pioneer, Monsanto-DEKALB, and Dow-Mycogen supply 60% of current corn seed sales by volume. These three offer an excellent opportunity for market penetration by *Rpr*<sup>TM</sup> because the Sun Dance Genetics platform is a novel genetic resource for corn rootworm resistance. These companies are looking to license such innovative technologies to increase their own seed sales and bridge into new markets. See Appendix I for a letter from Novartis expressing interest in licensing Sun Dance technology. Our product will also afford other seed producers increased sales, penetration into new markets, and a level of independence from the top three. There is strong demand in this market because of the high cost of managing this insect problem, the environmental and human health risks of pesticides, and the potential crop loss. The market also has increased growth potential in areas where farmers are no longer able to rely on crop rotation methods for managing rootworm infestations. This is the result of a new variety of rootworm that lays its eggs in non-corn fields where they remain dormant until the corn is replanted.<sup>10</sup> As this new rootworm biotype spreads and farmers are forced to find alternative insect management strategies, all acreage will be affected.<sup>11</sup> Given its growth potential, the market for the corn rootworm resistance initial product is an excellent segment.

In addition to our rootworm resistance product, another product in the development pipeline is drought tolerance.<sup>12</sup> Drought is the most significant factor causing crop loss in hybrid corn.<sup>13</sup> The advantage of drought resistant corn is to reduce crop loss and eliminate the need for irrigation under moderate drought conditions. It will also reduce the amount of supplemental water needed in severe water stress conditions. Another advantage is reduction in equipment, labor, and energy costs, as well as depletion of ground water reserves associated with irrigation. Approximately 15 million acres of corn are irrigated annually at a cost of \$100/acre for a total annual expense of \$1.5 billion for corn growers.<sup>14,15,16</sup>

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<sup>5</sup> NSF/SBIR Phase II/IIB Award No. 9830138 Final Report, Investigation of Novel Genetic Resources for Rootworm

<sup>6</sup> National Corn Grower's Association, The World of Corn 2000 <http://www.ncga.com>

<sup>7</sup> See Appendix I, page 31

<sup>8</sup> See Market Analysis section, page 19.

<sup>9</sup> Levine, Eli and Michael Gray. *Center for Economic Entomology Rootworm Problems in First-year Corn: an Update*. INHS Reports May-June 1996. <http://www.inhs.uiuc.edu/chf/pub/surveyreports/may-jun96/rootworm.html>

<sup>10</sup> Lee, Thomas "Corn Rootworm Resistant Corn Moves Closer to Market." St. Louis Post-Dispatch. July 23, 2001 [http://www.biotech-info.net/closer\\_to\\_market.html](http://www.biotech-info.net/closer_to_market.html)

<sup>11</sup> Ferber, Dan. "New Corn Plant Draws Fire from GM Food Opponents." *Science*, Feb. 25, 2000, vol. 287, p. 1390.

<sup>12</sup> See Market Analysis section. Pg. 19.

<sup>13</sup> Kramer, P.J., Boyer J.S. *Water Relations of Plants and Soils*. Academic Press Inc NY.

<sup>14</sup> Calculated from USDA-NRCS-RID National Resources Inventory. <http://www.nhq.nrcs.usda.gov/land/meta/m5298.html> 1997.

<sup>15</sup> 2001 Irrigation Cost Estimates. Griffi, Terry. University of Illinois at Urbana-Champaign

These growers who irrigate will be the early adopters of drought resistant technology. Because a reduction in grain yield is caused by even brief water deficit at any time during the growing season, we anticipate wide market adoption of this product beyond the early adopters. This product will also find acceptance globally because drought is a worldwide phenomenon.

Traits that enhance physiological responses to water stress will subsequently be licensed to corn seed companies for incorporation into their elite lines. Preliminary tests indicate that Sun Dance germplasm has the capacity to increase yield during drought conditions as great or greater than 25%. Even in non-drought conditions, Sun Dance Genetics' germplasm helps plants use water more efficiently and increase yield even in non-drought by 10% or more. This drought resistance trait is as far along in development as the rootworm resistance trait and would be brought to market at about the same time as Sun Dance Genetics' rootworm resistance trait with sales comparable to those projected for the rootworm trait.

### Market potentials for first two products<sup>17</sup>

	U.S.	Foreign
<b>Rootworm resistance</b>	\$600 million +	\$200 million <sup>18</sup>
<b>Drought resistance<sup>19</sup></b>	\$750 million <sup>20</sup>	\$460 million <sup>21</sup>
Total	\$1.35 billion	\$660 million

***U.S. and Foreign market potential combined for these two traits alone = \$2 billion***

### The Key Management Issues

The opportunity provided by Sun Dance Genetics has attracted the involvement of many high-level industry experts and executives. In developing this entrepreneurial venture, Sun Dance Genetics has been able to bring together a solid management team and advisory board. Highlights include **XXX**, who will be CEO of Sun Dance Genetics. Dr. XXX is currently Senior Vice President, Assessment and Strategy Development of XXX. Dr. XXX is former President of XXX. XXX, now a subsidiary of XXX, was purchased for its seed business and is now the backbone of XXX's market share. As former president of XXX, Dr. XXX brings an icon of the seed industry to Sun Dance Genetics. His valuable inside knowledge and business relationships offer contacts throughout the industry that will aid in licensing our technology.

The second cornerstone of our management team is founder and Chief Scientific Officer (CSO) **Mary Eubanks, Ph.D.**, Adjunct Professor of Biology at Duke University. The Sun Dance reputation is already growing as a result of her scientific work. Dr. Eubanks' scientific accomplishments have resulted in all of Sun Dance Genetics patents. She has written an award-winning book, published over 70 papers in scientific journals, and produced over 100 Environmental Protection Agency research reports. Dr. Eubanks has received acclaim for her study of the origin of corn in a recently published book *The Age of Science*<sup>22</sup>. In 1997 she was featured in *Discover* magazine for resurrecting a distant ancestor of corn. She has been researching corn genetics for many years, and has received \$575,000 in grants from the National Science Foundation.

[http://web.extension.uiuc.edu/macombcenter/FBM&M/Fact%20Sheets/irr\\_fact\\_sheet.pdf](http://web.extension.uiuc.edu/macombcenter/FBM&M/Fact%20Sheets/irr_fact_sheet.pdf)

<sup>16</sup> National Corn Grower's Association, The World of Corn 2000 <http://www.ncga.com>

<sup>17</sup> For detailed calculations see Market Analysis section, Future Trends and Opportunities, page 19.

<sup>18</sup> Enserink, Martin. "Biological Invaders Sweep In." *Science*, Sept. 17 1999 vol.285p.1834-1836. Note: Takes into account continued rootworm expansion. It is anticipated that rootworm infestations will model the patterns found in the U.S. Most U.S. acreage can be affected in any one year. Similar levels of infestation are expected to be achieved throughout Europe over the next few years.

<sup>19</sup> These are conservative estimates of the drought resistance market. See Market Analysis section pg. 19 for details.

<sup>20</sup> This number is calculated from the current cost of irrigation of US corn acres.

<sup>21</sup> Postel, Sandra. "Redesigning Irrigated Agriculture." *The State of The World 2000*. W.W. Norton & Company. New York, 2000. p.40; World of Corn. <http://www.ncga.org>; the Food and Agriculture Organization of the United Nations (FAO) 2001.

<http://apps.fao.org/page/collections?subset=agriculture>

Note: This number is based on 18 million acres of irrigated corn fields in the EU, Latin America, China, and others. Cost of irrigation is set at \$100/acre and 25% willingness rate.

<sup>22</sup> Piel, Gerard. *The Age of Science: What Scientists Learned in the Twentieth Century*, Basic Books, New York, 2001. Note: Gerard Piel is the founder of *Scientific American* and recipient of over 20 honorary doctoral degrees from universities in the U.S. and abroad. He was twice elected to the Board of Overseers of Harvard University.

## Key Advisors

Complementing the Sun Dance Genetics team are these experienced advisors. The Board of Advisors features extensive entrepreneurial expertise as well as many years of involvement in the biotech and agribusiness industries.

### *Venture Capital and Entrepreneurial Advisors:*

- **XXX MD, Ph.D.** and a Principal at XXX, one of the most active and experienced early-stage venture funds in the Southeast.
- **XXX**, founder, XXX, which serves as a consulting firm to entrepreneurial ventures.

### *Financial Advisor and Operations Advisor:*

- **XXX, CPA, MBA**, who has served as CFO or COO for entrepreneurial ventures for the last decade.

### *Legal Advisor:*

- **XXX, Ph.D., L.D.**, one of the pre-eminent patent attorneys in the Southeast.

### *Business Development Advisors:*

- **XXX, Ph.D.**, founder and president of XXX who has negotiated many licensing agreements in the biotechnology industry.
- **XXX, Ph.D.**, Director of Duke University's Markets and Management Program, has extensive experience in international business development and globalization.
- **XXX, Ph.D.**, as an expert on the psychology of work brings professional team-building experience in the context of entrepreneurial business development.

### *Marketing Advisor:*

- **XXX, MS**, founder of XXX, brings 30 years experience in marketing and public relations within the agricultural industry.

### *Scientific Advisors:*

- **XXX, Ph.D.**, University of XXX Professor Emeritus and renowned corn breeder who developed XXX's patented sweet corn.
- **XXX, Ph.D.**, XXX University Professor of XXX, an expert in the science and management of soils in the Southeastern United States.

## Financial Plan

### *Funding Requirements*

Sun Dance Genetics is actively seeking venture capital and other forms of funding to achieve commercialization. In order to expand our research and development program, Sun Dance is in search of venture capital partnerships. To date, over \$500,000 has been invested in Sun Dance Genetics in the form of National Science Foundation grants.

### **Areas of Funding Distribution**

Indirect Costs	1,714,656
Product Development	993,124
Sales and Marketing	1,124,313
Administrative	518,218
Equipment & IP Purchases	799,229
Bioassays	312,000

Amount needed to reach market	<b>\$4 million</b>
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This amount would bring Sun Dance through Milestone 3 and factors in all additional expenses, taxes, raises, etc, which are included in the full financial tables.

#### Market and Sun Dance Revenue for Rootworm trait (at a glance)

Years	2005	2006	2007
Acres planted <sup>23</sup>	9 million	27 million	45 million
Total units sold <sup>24</sup>	3 million	9 million	15 million
SD Units Sold	500,000	3 million	6 million
SD market share (%) <sup>25</sup>	2%	11%	22%
SD premium / unit <sup>26</sup>	\$10	\$10	\$10
SD est. revenue	\$5 million	\$30 million	\$60 million

#### Market and Sun Dance Revenue for Drought Tolerance trait (at a glance)

Years	2005	2006	2007
Acres planted <sup>27</sup>	6 million	15 million	30 million
Total units sold <sup>28</sup>	2 million	5 million	10 million
Units from which SD receives royalties	1 million	3 million	7 million
SD market share (%)	4%	11%	26%
SD premium / unit <sup>29</sup>	\$15	\$15	\$15
SD est. revenue from drought	\$15 million	\$45 million	\$105 million

<b>Total SD est. revenue (Rootworm + Drought)</b>	<b>\$20 million</b>	<b>\$75 million</b>	<b>\$165 million</b>
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#### Exit Strategy

In the biotechnology industry, investors are usually able to take profit in two situations: either the startup goes public or is acquired by another company. Either one of these scenarios is a likely prospect for Sun Dance Genetics. In determining the company valuation, Sun Dance has used a revenue multiple of 3, which is common in the agricultural biotechnology industry.<sup>30</sup> Using this multiple and Sun Dance Genetics' third year combined trait revenue of \$165 million puts the company valuation at \$495 million. The predicted exit point would be in 2004, after Milestone 2 has been achieved and as Sun Dance is entering into licensing agreements, but before any product has come to market.

<sup>23</sup> Expansion is based on *Bt* corn for corn borer resistance; corn rootworm is known to be a much more serious and widespread insect pest problem than corn borer.

<sup>24</sup> One unit plants approximately 3 acres. National Corn Growers Association. World of Corn 2001. <http://www.ncga.com/03world/main/index.html>

<sup>25</sup> calculated from SD Units/ total corn Units sold on market(27 million units).

<sup>26</sup> Farmers currently spend \$13.33 an acre on insecticides, which equals the equivalent of \$40 per unit (bag). We project the total per bag premium for rootworm resistant seed will be \$20, of which Sun Dance will garner 50%.

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<sup>30</sup> Biotechnology Research Services, Hoover's Online <[http://www.hoovers.com/premium/comp\\_data/5/0,2151,61815,00.html](http://www.hoovers.com/premium/comp_data/5/0,2151,61815,00.html)>

## **VISION AND MISSION**

### **Vision Statement**

The Effect of Innovative Technology Can Never Be Underestimated.

**“Truly new genotypes, with quite diverse parentage as part of their pedigree, have been responsible for virtually all large stepwise advances in yield in all field crops.”**

*- D. N. Duvick, former VP, Pioneer Hi-Bred International 1986*

The vision of Sun Dance Genetics is to utilize Dr. Mary Eubanks’ proprietary platform technology to transfer beneficial genes from gamagrass to corn. Sun Dance Genetics employs conventional plant breeding methods and offers a complement or alternative to genetically modified maize. The goal is production of hybrid corn seed adapted to a broad spectrum of environmental conditions for diverse commercial markets worldwide.

### **Mission Statement**

In order to achieve our vision, Sun Dance Genetics commits to the following:

*Sun Dance Genetics’ Mission is to provide seed production companies with solutions for crop improvement and protection. We will accomplish this mission through using our proprietary genetic bridge to move beneficial traits into corn seed and then licensing the production of our seed to seed producers already established in the industry. Our focus is the identification and transfer of new traits from gamagrass into corn. This will allow the creation of a pipeline of crop improvement products. Through a long-term commitment to this mission, we will be a company that seed producers look to for new beneficial crop traits. Sun Dance Genetics is committed to developing environmentally friendly products.*

## **COMPANY OVERVIEW**

### **Company History**

Sun Dance Genetics was founded in 1988 as a consulting firm on the environmental fate of agricultural pesticides. In 1993, Dr. Eubanks began investigating the feasibility of using the gamagrass-teosinte crosses as a platform technology to confer beneficial traits into corn. The first traits chosen for development are corn rootworm resistance and drought tolerance. The industry had tried for many years to tap the gamagrass source of insect resistance and drought tolerance in corn that failed because of reproductive sterility. The research to develop corn lines resistant to corn rootworm was first funded by the National Science Foundation Small Business Innovation Research Program in 1997. Since 1989, five patents have been awarded on Dr. Eubanks’ novel gamagrass-teosinte hybrids and hybrid corn lines. A sixth United States patent and international patent applications are pending. In field tests conducted at the USDA – Northern Grain Insects Research Laboratory, Brookings, South Dakota every summer from 1997 through 2001, rootworm feeding damage was significantly reduced in the breeding lines that contained the Sun Dance rootworm resistance genes compared to corn lines that did not. For a closer look, see the photo on page 1. In water deficit experiments, currently funded by the North Carolina Biotechnology Center, drought stressed Sun Dance hybrids have demonstrated significant yield increases compared to standard corn.

### **Social Goals**

The vision that inspired Sun Dance Genetics’ founder Dr. Mary Eubanks was that the development of this company and the technology behind it would lead to benefits for humanity. Dr. Eubanks and Sun Dance Genetics stand firmly behind this commitment to use this technology in feasible

ways to benefit humanity and the environment. Thus, the social goals of Sun Dance Genetics will be to encourage and support sustainable agricultural practices, which attempt to solve world problems ranging from environmental degradation to world hunger.

### **Current Status**

Sun Dance Genetics, founded in 1988, is a sole proprietorship owned by Dr. Mary Eubanks. Sun Dance Genetics is currently engaged in research and development of improved corn germplasm using a novel genetic bridge derived from crossing two wild relatives of corn. The business office and lab location of Sun Dance Genetics are in Durham North Carolina. Additional laboratory space is rented at the Duke University National Phytotron as needed. Dr. Eubanks has a successful track record of developing the innovative *Tripsacum-diploperennis* genetic bridge by combining crossing experiments with molecular plant genetics. Dr. Eubanks is currently finishing the final bioassays to complete the rootworm resistance proof of concept. Recently advisors, partners, and new team members have been successfully recruited with extensive entrepreneurial and industry experience. Now that feasibility is established and breeding lines have been developed, Sun Dance Genetics is expanding to aggressively pursue commercialization.

The most immediate goal of Sun Dance Genetics is to complete the research and testing necessary to move the rootworm resistance trait to the commercialization phase. Our market research shows that the demand for this product alone justifies this business.

### **Other Development Possibilities**

- Using market penetration and licensing revenue to move to full-scale independent seed production.
  - Potentially employing vertical integration.

### **Management Team**

The opportunity provided by Sun Dance Genetics has attracted the involvement of high-level industry experts and executives. In developing this entrepreneurial venture, Sun Dance Genetics has been able to attract a solid management team and advisory board.

#### ***XXX, President / CEO***

XXX received his Ph.D. from XXX University in molecular genetics. He has held many high-level executive positions in the agricultural biotechnology industry in the last 25 years. As a seed industry executive, he managed XXX's worldwide seed division comprised of more than 20 wholly-owned subsidiaries, joint ventures, and licenses in North, Central and South America, Europe, Africa, Asia, and Australia with revenues of \$300 million. His experience encompasses dealing with international subsidiaries, acquisitions, divestitures, strategic alliances, breeding and biotechnology R&D management, intellectual property rights, strategic planning, and technology transfers. He was the architect of the biotechnology strategy that produced an increase in shareholder equity of more than \$2 billion. He negotiated strategic alliances with XXX, XXX, Inc., and XXX International, and the framework for XXX technology cross-licensing agreement. In each case, he secured access to new technology with no cash outlay. He also negotiated the purchase of XXX., an acquisition that produced a 50-fold return in 4 years.

#### ***Dr. Mary Eubanks, Founder / President / CSO***

The Sun Dance Genetics intellectual property portfolio is the sole result of the scientific work done by Dr. Mary Eubanks over the last 15 years. Dr. Eubanks will serve as the company's Chief Scientific Officer. Her genetic crossing and DNA testing established that corn evolved from recombinants between gamagrass and teosinte. This discovery resolved the controversy surrounding the

origin of corn and is considered one of the significant scientific discoveries of the 20<sup>th</sup> century<sup>31</sup>. She has demonstrated a mechanism of genome reorganization that results in formation of new species. This finding is the basis for her ancestral genes model for crop improvement.

### **The Board<sup>32</sup>**

Sun Dance Genetics has brought together an array of world-class advisors. Having brought in this core team of executives, we have assembled a world-class group of board members to guide our executives and the young entrepreneurs responsible for building this plan and moving this business from a one-person scientific endeavor to a budding business venture. The Board consists of many successful businessmen and women with long years of experience in agribusiness, venture capital, entrepreneurship, finance, marketing and strategic planning. As Sun Dance moves towards bringing its products to market it will be able to rely on this vast array of experience and contacts to ensure its success.

#### *Venture Capital and Entrepreneurial Advisors:*

##### **XXX, MD, PhD**

Dr. XXX of XXX received his B.S.E degree in Chemical Engineering and Biology from XXX University. He then received a full scholarship to attend XXX Medical School, graduated at the top of his class, and received his Ph.D. in Biomedical Engineering from XXX. His role at XXX involves supporting portfolio companies strategically, operationally, and scientifically. Dr. XXX has been a clinical scientist at XXX, focusing on clinical trials and marketing. He has been actively involved in commercializing early stage technology with the XXX University Office of Science and Technology. Additionally, Dr. XXX has spent time as a management consultant with XXX. He is now a principal in XXX. His knowledge and entrepreneurial experience in the field of biotechnology as well as his involvement in XXX will be a great asset for our company.

##### **XXX**

XXX, founder, XXX, is a business consultant who has worked in all aspects of the venture capital field for more than a decade. XXX links entrepreneurs with venture capitalists.

#### *Financial Advisor and Operations Advisor:*

##### **XXX, CPA, MBA**

Mr. XXX, a graduate of XXX's School of Business brings many years of experience in business financial matters to our Board of Advisors. For the last six years he has served as Director of Finance and Administration at XXX, a rapidly growing international research-based pharmaceutical company. Before that, he worked as Vice President of Operations from 1995 - 1996 for XXX. From 1992-1995 he also served as Vice President of Finance and Administration, as well as Treasurer for XXX. Mr. XXX provides guidance through his years of experience as head of finance and operations for an array of entrepreneurial endeavors.

#### *Business Development Advisors:*

##### **Dr. XXX, Ph. D.**

Dr. XXX has 14 years experience managing biotech ventures, and has successfully negotiated licensing agreements with several of the major players in the pharmaceutical industry. XXX has a Ph. D. in molecular biology, and is founder and President of XXX, a biotechnology firm that designs and manufactures novel diagnostic devices for DNA amplification, analysis, and screening. XXX is the

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<sup>31</sup> Piel, Gerard. *The Age of Science: What Scientists Learned in the Twentieth Century*, Basic Books, New York, 2001. Note: Gerard Piel is the founder of *Scientific American* and recipient of over 20 honorary doctoral degrees from universities in the U.S. and abroad. He was twice elected to the Board of Overseers of Harvard University.

<sup>32</sup> This list contains our full Advisory Board, from this group, individuals will be selected for the Board of Directors and offered a share in the company for their time. This Board of Directors, will assist our management team in making appropriate decisions and taking the most effective action; however, they will not be responsible for management decisions. An all-equity package would be appropriate as a compensation strategy. Please see <section on compensation packages>

inventor on nine XXX patents.

***Dr. XXX, Ph.D.***

Dr. XXX is Professor of Sociology and Director of the Markets and Management Studies Program at XXX University, where he teaches courses in economic sociology, globalization and comparative development, as well as international competitiveness. He received his Ph.D. degree from XXX University. He has been a consultant to an array of international organizations including: the United Nations Centre on Transnational Corporations (New York); the United Nations Industrial Development Organization (UNIDO); and the U.S. Agency for International Development. In addition to his on-going exposure to the entrepreneurial process, Dr. XXX's knowledge of and contacts throughout the management, entrepreneurial and venture capital spheres are an invaluable resource in helping our business.

***Dr. XXX***

Dr. XXX, Emeritus Professor in the XXX, is also a professor for the XXX Markets and Management Program. His studies include adult psychological growth, development, and career development. His primary contributions to Sun Dance Genetics come in the form of his entrepreneurial and business contacts. Additionally, his research in the area of the psychology of work provides excellent insight into the business development process.

***Marketing Advisor:***

***XXX***

Mr. XXX is an agribusiness consultant with many high level connections in agriculture in North Carolina. In 1994, he founded the XXX, which focuses on developing and executing multi-media communications projects aimed at growers and retailers, as well as the general public. A veteran agrimarketer and accredited public relations practitioner, Mr. XXX has 30 years experience with companies, cooperatives and associations advising them on all aspects of advertising, public relations, and promotional strategies. Believing that involvement in agribusiness organizations and the industry is important to his business, XXX has served as an officer in the National AgriMarketing Association and an active member of the AgriRelations Council on a national level.

***Legal Advisor:***

***XXX***

Dr XXX is an attorney with XXX, a nationally known intellectual property and business law firm. He has held positions as an attorney for XXX and as a patent examiner at the U.S. Patent and Trademark Office. He is one of the most respected IP attorneys in the agricultural biotechnology industry.

***Scientific Advisors:***

***Dr. XXX***

Dr. XXX, XXX University Professor Emeritus, is one of the world's leading authorities on corn and its wild relatives. He developed the patented sweet corn variety sold by XXX. His lifetime of work and achievements in corn breeding were recognized by the Society for XXX, which named him Distinguished XXX in 1994. He received his Ph.D. in Agronomy from the University of XXX and did postdoctoral training under famed corn geneticist XXX at XXX University.

***Dr. XXX***

Dr. XXX, Professor in the XXX will serve as a scientific advisor. Dr. XXX is a soil science expert, with special emphasis on the fertility and management of acid soils of the southeastern US and the tropics. He is collaborating with Dr. Eubanks on a research project to develop Sun Dance aluminum tolerant corn lines that can be grown on acid soils.

## **Ownership**

All officers and employees of Sun Dance Genetics will be offered equity positions in the company. Currently there are no outside investors. The ownership breakdown will be as follows:

Dr. Mary Eubanks	80%
Other employees	20%

## **Business Development**

Sun Dance Genetics recognizes that additional staff is required to support research and development in order to aggressively move products to commercialization. The Duke University students who have invested a tremendous amount of time and energy in researching, designing, and writing the business model have bonded into an enthusiastic, energetic, and synergistic team of passionate and committed young entrepreneurs dedicated to the future of Sun Dance Genetics. The complementary personalities, skills, interests, and international experience of these gifted individuals are a recipe for success. These college seniors are excited about the opportunity to help grow this business, and are willing to accept below market salaries in exchange for shares in the company they will help build.

### **XXX, Director of Business Development & Operations**

- In charge of business strategy, coordination of international activities, Head of Latin American Affairs, as well as implementation of venture capital and fundraising initiatives.
- Sam is an entrepreneur who co-founded an IT consulting firm built on an outsourcing model. As the company's director of new business development and its chief strategist he utilized salary differentials within third world countries to generate continuous profits from the company's inception. His network of contacts throughout Latin America will ease Sun Dance's transition into one of the world's major corn markets.

### **XXX, Director of Scientific Operations**

- In charge of coordinating research activities & data collection, overseeing experimentation, management of scientific staff, and venture capital acquisition
- Eesley's experience includes years of work in XXX University labs, beginning with work in the genetics lab of Dr. XXX, XXX University Medical School Vice Dean for Education. His lab experience includes work in plant genetics. He also brings an array of entrepreneurial contacts that will provide Sun Dance Genetics with access to a great deal of professional guidance and experience.

### **XXX, IT Solutions (work study associate)**

- Head of European Affairs, European Market Research & Establishment of Industry Contacts
- As a double major in Economics and Computer science, Stoisor has worked in several information technology roles including the American Computer Experience, the XXX Department of Electrical and Computer Engineering, and the Humanities Computing Laboratory as a Java Programmer developing a multimedia windows learning environment for the web. His experience as Co-VP of publicity for the XXX International Association gave his exposure to fundraising, management, and international relations. XXX's foreign heritage and ability to speak four languages: English, Romanian, German, and Italian also make him an ideal ambassador to potential European clientele.

### **XXX, Market Strategist (part time associate)**

- Head of Asian Affairs, focusing on Chinese and Pacific Rim Market Research
- XXX will receive his degree with a double major in Economics and Sociology and a certificate in Markets & Management from XXX University in May 2002. XXX spent several months in XXX with XXX's Equities Division. This experience allowed him to develop an

understanding of Asia's equity market. Starting in the summer of 2002 he will be relocating to XXX where he will be able to analyze China's corn seed industry first hand.

**XXX**, Financial Analyst (part time associate)

- Head of Indian Affairs
- XXX will receive his degree in Economics and a certificate in Markets and Management from XXX University in May 2002. While interning at XXX he authored a report on B2B e-commerce in India. He has also helped develop telematics strategies for a major telecommunications company while with the XXX. Starting in the summer of 2002 XXX will begin work for XXX in XXX. He has agreed to do part-time market analysis for Sun Dance in an effort to enable the firm to develop strategic plans for future international market expansion.

## **PRODUCT STRATEGY**

### **Technology**

Sun Dance Genetics has developed proprietary germplasm that employs conventional plant breeding methods and offers a complement, or alternative, to genetically modified corn. A novel, fertile hybrid obtained by crossing two wild grasses, teosinte and Eastern gamagrass, provides a genetic bridge for moving beneficial traits from its gamagrass cousin into corn. Because the hybrids are cross-fertile with corn, beneficial traits can be transferred into corn using simple cross-pollination techniques and conventional breeding methods. This is a major technological breakthrough for corn improvement because gamagrass has numerous highly desirable traits.

### **Proprietary Technology**

Our technology is protected under the following utility and plant patents:

#### **Utility patents on the method:**

U.S. Patent No. 5,330,547 issued July 19, 1994

Methods and Materials for Conferring Tripsacum Genes in Maize

- *This invention is a method for transferring. Tripsacum nuclear and cytoplasmic genes into maize via a hybrid plant designated Tripsacorn, produced by crossing two wild relatives of corn, Tripsacum and diploid perennial teosinte (Zea diploperennis). This invention thus relates to the hybrid seed, the hybrid plant produced by the seed and/or tissue culture, variants, mutants, and modifications of Tripsacorn and the hybrid seed, the hybrid plant produced by the seed and/or tissue culture, variants, mutants, and modifications of (maize X Tripsacorn) and/or (Tripsacorn X maize). In particular this invention is directed to the ability to confer rootworm resistance, resistance to insect pests, resistance to disease, drought tolerance, and improved standability to maize via Tripsacorn.*
- *The methods covered under this patent are the basis for the platform technology that transfers traits.*

U.S. Patent No. 5,750,828 issued May 12, 1998

Methods and Material for Conferring/Tripsacum Genes in Maize

- *This patent expands the coverage of Patent No. 5,550,547. It provides a method for transferring Tripsacum nuclear and cytoplasmic genes into maize using any hybrids created by crossing Tripsacum and teosinte. This is an inclusive patent that covers everything from molecules to seeds and all other aspects of the plant including all mutations.*
- *This patent expands the platform technology's potential by covering all hybrids past, present, and future.*

International Patent application No. PCT/US99/17716, filed August 5, 1999.

- Novel Genetic Materials for Transmission into Maize
- *Applications for this patent have been filed in the United States, European Union, Canada, Brazil, Australia and New Zealand.*
- *Novel DNA sequences derived from crossing two wild grasses related to maize can be transferred into maize by crossing it with the gamagrass-teosinte hybrids. These novel DNA sequences provide 133 unique molecular markers for assisting selection of desirable traits in plant breeding programs, for detection of target DNA sequences in genetic analyses, and for identification of new genes for corn improvement that may enhance resistance to insect pests and diseases, drought stress tolerance, cold tolerance, perennialism, grain yield, totipotency, apomixis, improved root systems, tolerance of water-logged soils, tolerance of high-aluminum acidic soils, improved grain quality, enhanced forage quality, and adaptability to a CO<sub>2</sub> enriched atmosphere.*
- *This patent covers 133 novel DNA sequences identified in the hybrids covered under the plant patents PP6906, PP7977, and PP9640.*
- *Pending.*

**Plant patents:**

U.S. Patent No. PP6906 issued July 4, 1989

Corn Plant Named Sun Dance

- *A new variety of a corn plant distinguished by its drought resistance, multiple types of inflorescence, bifurcated styles and profuse production of fruit, with up to five to ten ears being on one stem.*

U.S. Patent No. PP7977 issued September 15, 1992

Corn Plant Named Tripsacorn

- *A new distinct corn plant that is the product of a cross between Tripsacum and perennial teosinte. This plant is fertile, has been proven to be cross compatible with corn (Zea mays L.) and offers an avenue to expand the gene pool for commercial corn varieties. This plant is perennial, offers outstanding drought and heat tolerance, has survived temperatures of 0 degrees Fahrenheit, as well as offering enhanced pest resistance for importation into corn through breeding programs.*

U.S. Patent No. PP9640 issued September 3, 1996

Corn Plant Named Sun Star

- *A new and distinct corn plant which is the product of a cross between diploid Tripsacum and perennial teosinte. This plant is fertile, has proven to be cross compatible with corn. and offers an avenue to expand the gene pool for commercial corn varieties. This plant is also perennial, offers resistance to corn rootworm, remarkable drought tolerance, and prolific production of fruit.*

These patents provide a solid intellectual property (IP) portfolio and a monopoly on a unique technology platform. By serving as a complement to those products being developed by other companies, as well as an alternative not subject to regulatory oversight of genetically engineered seed, Sun Dance expects to avoid much of the direct competitive pressures associated with entering new markets. With proper funding Sun Dance Genetics will be able to immediately expand its intellectual property portfolio by filing new method and plant patents on already completed research.

**Useful Features / Benefits**

In her breeding program, Dr. Eubanks has screened 140 hybrid lines. Natural insect resistance demonstrated in field tests is impressive. In addition to rootworm resistance, this novel germplasm

exhibits a number of other potentially valuable traits. The traits listed below would represent additional products that may stem from our proprietary platform technology. Successful development of future traits would allow Sun Dance to bridge into new markets and increase the overall potential of this business venture. These traits would be transferred to corn, one at a time, providing a pipeline of new markets and opportunities.

***Potential traits for maize improvement via this genetic bridge:***

- Drought resistance
- Insect resistance
- Disease resistance
- Cold tolerance
- Hybrid vigor
- Grain yield
- Grain quality
- Improved standability
- Flooding tolerance
- Perennialism
- Increase in ear numbers
- Forage quality
- Acid soil tolerance
- Aluminum tolerance
- Totipotency

**General benefits of natural corn rootworm resistance include:**

- Resistance through various methods
  1. Non-preference, insects avoid feeding.<sup>33</sup>
  2. Strong root re-growth in response to herbivory.
    - Some feeding appears to benefit the plants
    - Some lines increased their yield post-infestation
  3. XXXr™ technology focuses protection in the roots where this pest feeds
- An environmental safe alternative to pesticides
- Provide continuous crop protection from outbreak of corn rootworm
- Employs conventional methods not subject to regulatory obstacles
- Conventional plant breeding methods lower production costs
- Welcomed by anti-GMO markets around the world
- Provides an additional tool for insect control management strategies

**Milestones**

Sun Dance Genetics must achieve specific objectives before the rootworm resistant and drought tolerant products can reach commercialization:

**Milestone 1: Demonstrate rootworm resistance and drought tolerance in bioassays (completed).**

- A series of insect bioassays conducted under controlled environmental conditions in growth chambers over the last 4 years have demonstrated rootworm resistance. Pilot tests in climate-controlled chambers have also demonstrated drought tolerance in some of the same hybrid lines. DNA fingerprinting was employed to identify the number of genes involved in expression of the trait and molecular markers that co-segregate with rootworm resistance and drought tolerance. This will speed up selection in a large-scale commercial breeding program in future phases. Milestone 1 confirmed that rootworm resistance and drought tolerance has been imparted to corn. Rootworm resistance has been verified in field tests in South Dakota, Illinois, and Minnesota.
- Milestone 1 testing complete for rootworm resistance trait.
- Milestone 1 testing complete for drought tolerance trait.

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<sup>33</sup> Independent video verification by the USDA/ARS Northern Small Grains Insect Research Laboratory, Brookings, SD.

**Milestone 2: Demonstrate stability of rootworm resistance and drought tolerance trait expression in a uniform population (projected completion by 2003).<sup>34</sup>**

- To date, seventh generation backcross corn lines with greater than fifty percent rootworm resistant and drought tolerant plants have been obtained. To move to commercialization, all plants must uniformly express these traits. We expect to recover lines with uniform expression of the trait within a few more bioassays. This business plan projects the resources needed to conduct 6 bioassays per year. At this rate, we expect to achieve uniform expression by 2003. The plan calls for Sun Dance Genetics to run 12 bioassays. Completion of this phase is dependent on acquiring adequate funding to cover both the scientific and operational expenses.
- Currently exploring partnering options to complete Milestone 2 for the XXX™ and drought tolerance trait.

**Milestone 3: Demonstrate performance advantage in the field (projected completion by 2003).**

- Stability of inheritance of these traits will be established by planting seed from resistant and susceptible plants with the same pedigree. This seed is in hand and in the process of being genotyped by DNA fingerprinting that will allow us to pinpoint the genetic loci involved in expression of rootworm resistance. Comparison in field tests will demonstrate side-by-side performance advantages.
- Funding request would cover this milestone.

**Milestone 4: License traits to potential partners – Negotiations already begun and will pick up speed at the completion of Milestone 2. (commercial breeding and testing takes 2 to 3 years).**

- Sun Dance Genetics will license the rootworm resistance and drought tolerance traits to companies with commercial breeding programs. These companies will then incorporate Sun Dance technology into their elite inbred lines and proprietary hybrid corn seed. Throughout this process they will conduct their own field tests to verify the resultant plant quality and yield.
- Milestone payments could begin to come in as revenue to Sun Dance from these licensing companies.

In addition to the research, testing, and development for these two traits, we are investigating the feasibility of other traits. Through continuous research Sun Dance Genetics plans to generate a pipeline of opportunities by bringing new traits to market in the future. Once we have completed the science for placing the rootworm resistant and drought tolerant traits on the market, we will be able to refocus our scientific expertise to other potential trait targets.

**Time to Market**

In order to capitalize on this market Sun Dance must achieve four key scientific milestones. We project that the necessary research, development, and licensing will be achieved within the next 3 to 4 years. Based on this projection we will receive our first royalty revenues in 2005. This does not include yet to be negotiated milestone payments from potential licensees. With adequate funding we believe we can rapidly bring additional products to market.

**MARKET ANALYSIS**

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<sup>34</sup> Sun Dance Genetics will begin licensing negotiations with seed companies to use the technology in production of commercial corn immediately upon completion of Milestone 2. These licensing negotiations will continue throughout and beyond product launch.

## Market Definition

Corn is grown in more countries of the world than any other crop and is the world's most important economic crop. US corn production alone amounted to 9.9 billion bushels and generated \$18.44 billion in 2000. That same year overall world production was 23 billion bushels.<sup>35</sup> According to the American Seed Trade Association, in just 25 years, world corn demand will increase by 55%, requiring corn production to reach nearly 36 billion bushels annually.

Since Sun Dance Genetics uses a platform technology to move beneficial traits into corn, there are a wide variety of markets that will be targeted in the future. The rootworm resistance market, the drought tolerance market, and the disease resistance market are just a sample of the many sectors for which Sun Dance would eventually create products. As the world's population continues to expand, demand for higher yields, increased adaptability, and insect tolerance in corn products will grow significantly. Several models were utilized to establish both the potential overall market size and the speed at which this technology is likely to penetrate the market.

## Market Segment for Rootworm Resistance

Sun Dance plans to service the corn industry with proprietary germplasm that contains the strength of gamagrass bred into modern corn. In order to remain focused on continued scientific advancement of our platform technology we will license the trait - carrying germplasm to mainstream seed producers and collect royalties from subsequent seed sales. Sun Dance plans to bring an array of valuable traits to market in the coming years. An initial product in this pipeline of opportunities is native rootworm resistance from gamagrass. This product will serve as a complement or alternative to genetically engineered and chemical insecticide product lines offered by seed producers. As current rootworm prevention methods continue to falter, farmers are looking for the development of new options. This high demand is accentuated by the \$1.2 billion in costs and damages farmers incur annually because of this pest.<sup>36</sup> The innovation this industry awaits is the emergence of native rootworm resistance in corn.

The effect of the US rootworm epidemic can be broken down into \$1 billion in lost production, and \$200 million to \$600 million annually costs in post-infestation insecticides.<sup>37,38</sup> Sun Dance Genetics has factored in industry norms that dictate a consumer willingness to pay between 25-50% of their expected economic advantage. This means they are willing to pay a large percentage of their perceived gains in the form of increased costs towards acquiring the requisite technology.<sup>39</sup> This demonstrates that the potential margins to seed producers are thus in the \$600 million plus range.<sup>40</sup> Sun Dance Genetics expects to receive licensing revenues of the seed sales, which conservatively amounts to \$60 million in revenue within its third year on the market.

## Drought Resistance Market

Another trait we are developing is drought resistance. Drought resistance is a target for research because an increase in plant water use efficiency benefits all corn acres throughout the world by increasing yield stability. This drought resistance trait will be brought to market as another initial product of Sun Dance Genetics. To a varying degree drought negatively impacts yield at every stage of development for every acre, every year. Drought is the single most limiting factor in corn production. There are typically periods in every growing season when plants are drought stressed, even in areas with enough average rainfall. Drought resistant corn will reduce crop loss and eliminate the need for irrigation in many cases. It will also reduce the amount of supplemental water needed in severe water stress conditions. It will substantially reduce equipment,

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<sup>35</sup> National Corn Growers Association, World of Corn Statistics 2001 <http://www.ncga.com/03world/main/index.html>

<sup>36</sup> Lee, Thomas "Corn Rootworm Resistant Corn Moves Closer to Market." St Louis Post-Dispatch. July 23, 2001 [http://www.biotech-info.net/closer\\_to\\_market.html](http://www.biotech-info.net/closer_to_market.html)

<sup>37</sup> Appendix I – Letter from Novartis Vice President of Research and Technology

<sup>38</sup> Ferber, Dan. "New Corn Plant Draws Fire From GM Food Opponents." *Science*, 25<sup>TH</sup> February, 2000, vol. 287, Page. 1390.

<sup>39</sup> Rice, Thomas. Phone interview. Feb. 13<sup>th</sup>, 2002. Former president Dekalb International, currently the seed producing arm of Monsanto, Inc. note: transgenic modification includes genetic processes that result in "GMO's" such as Bt corn.

<sup>40</sup> Calculated using (50% of 1.2 billion)

labor, and energy costs (associated) with irrigation, and help reduce depletion of groundwater reserves. Commercial companies have already shown interest in licensing any germplasm with proven drought resistance traits. See Appendix II, for a letter from Novartis Vice President of Research and Technology expressing interest in licensing a drought resistance product from Sun Dance Genetics. Drought damage is difficult to quantify, therefore Sun Dance uses a yield increase model to project the market. An increase of just 5-10 bushels per acre is the minimum required to attract the attention of farmers. Preliminary tests indicate that Sun Dance germplasm has the capacity to increase yield during drought conditions greater than 25%, roughly the equivalent of 30 bushels per acre. Even in non-drought conditions, Sun Dance Genetics' germplasm helps plants to more efficiently use the available water and increase yield even in non-drought conditions by 10% or more, the equivalent of 15 bushels per acre. Currently US farmers spend \$1.5 billion per year in irrigating 15 million corn acres. Sun Dance technology would allow them to protect their fields at a fraction of the cost. Annual irrigation costs without including the high setup fees are approximately \$100/acre. These farmers are spending the equivalent of \$300/bag to protect their crops. As a result seed producers could easily justify increasing the price of a bag by the amount needed to pay Sun Dance Genetics the \$15/bag royalties. The result is a \$750 million market opportunity among these early adopters. In the long run this product will achieve market acceptance beyond the early adopters because it also improves the farmers yield.

### **Market Positioning**

Our company's primary strength lies in its development of a unique and proprietary technology platform for developing an array of valuable corn products. This technology is already protected by a number of patents and the IP portfolio will continue to grow. New US and international patents are currently pending. Our use of traditional breeding methods will enable producers who license our product to keep their costs low while providing a product that is superior to the genetically engineered alternatives currently under development. The use of traditional breeding will enable our partners to avoid the high costs of government regulation. Under the current system, transgenic products must undergo extensive safety for EPA, FDA, and USDA approval. Many of these new products are also currently banned from sale in the European Union. While these regulatory agencies do not necessarily represent an insurmountable obstacle to transgenic products, they add additional time and expense to the research and development process. This provides Sun Dance with market penetration opportunities. As rootworm infestations continue to grow and this pest spreads globally, our environmentally safe alternative will provide a valuable new tool for insect management strategies.<sup>41</sup> We are also well positioned because our business model allows us to focus our efforts on developing innovative scientific advancements. Licensing our product to seed producers allows us to instantly tap the marketing and distribution networks of many industry players. Through the revenue generated by these strategic partnerships, we will employ our technology platform to adapt to new market demands and opportunities.

### **Market Opportunities and Assets**

Our initial target market segment will be those farmers currently employing insecticides as their primary rootworm management system. In order to capture market share among these early adopters we will focus on licensing our technology to all seed producers. In the early stages of this endeavor, we project that the small and medium sized producers with breeding programs will be the first to adopt our technology. The three largest companies have spent millions developing their own proprietary rootworm resistant products and will likely place their initial market focus on distributing their own product lines. This leaves other producers in need of a product that will allow them to compete in the marketplace. This market sector collectively produces approximately 40% of the seed sold in the U.S.<sup>42,43</sup>

Another key asset is the versatility of our product. It can provide the developers of transgenic products with an alternative product that allows them entry in markets with regulatory restrictions.

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<sup>41</sup> Enserink, Martin. "Biological Invaders Sweep In." *Science*, Vol. 285, 5435, pp. 1809-2020, Sept. 17, 1999.

<sup>42</sup> Hayenga, Marvin. "Structural Change in the Biotech Seed and Chemical Industrial Complex." Iowa State University. 1997.

<sup>43</sup> Updated Alliances and Market Ordering are presented in the Alliance Chart. Detailed sources for that structuring are available with the chart.

Additionally, when farmers plant genetically engineered insect resistant corn, they are required to plant 20% of their acres in non-GE corn. This government requirement is intended to lessen the selection pressure for resistance to *Bt* toxins. Therefore 20% of the acres planted must be non-genetically engineered and in areas of overlapping corn and cotton production a 50% refuge area is required.<sup>44</sup> If and when approved, the *Bt* rootworm products will have a similar and possibly larger refuge requirement. This refuge could be planted to native rootworm resistance. These refuge acres represent the absolute minimum estimate of market size and provide a reason for the major companies to license the Sun Dance product to complement their GMO products. For example, if 74 million acres are affected by rootworm and 20% cannot have a transgenic solution that leaves 15 million acres still in need of protection.<sup>45</sup> These acres represent a market share for which Sun Dance Genetics has no competitors because these acres cannot be planted with genetically engineered corn. This amount of acreage is planted with 5 million bags and corresponds to a minimum of \$50 million in revenue.

Our product will also find a warm welcome among those distributors who service the organic and GMO-free markets. The XXX™ product will be more valuable if the current stigma against so-called “Frankenfoods” proves to be a continued phenomenon. It also currently serves as an alternative for those farmers who hope to export their crops to areas like the EU, Mexico, Japan, Brazil, and China where “GMO” imports are heavily restricted.<sup>46</sup> Under these and other diverse market situations *Rpr*™ technology will be able to adapt and thrive, because of its unique combination of cutting edge genetic research and traditional breeding techniques. As the first company to offer a non-transgenic solution to the rootworm threat we will have the opportunity to place our company on the national awareness radar. Many activist groups are looking for a technology they can champion as a true alternative that does not sacrifice product effectiveness and efficiency for traditional breeding. Sun Dance will also be able to generate tremendous public awareness through the social initiatives it plans to develop with potential partners including the United Nations. Aside from these valuable public relations opportunities, Sun Dance’s founder Dr. Mary Eubanks continues to bring the company recognition as a result of her ground breaking scientific work.

### **Speed of market expansion**

It is expected that the early adopters of this technology would be the farmers who are the insecticide users. The chemicals used to kill this pest are among the most toxic available for agricultural use. Farmers are in need of new solutions that will decrease their dependence on hazardous chemicals.

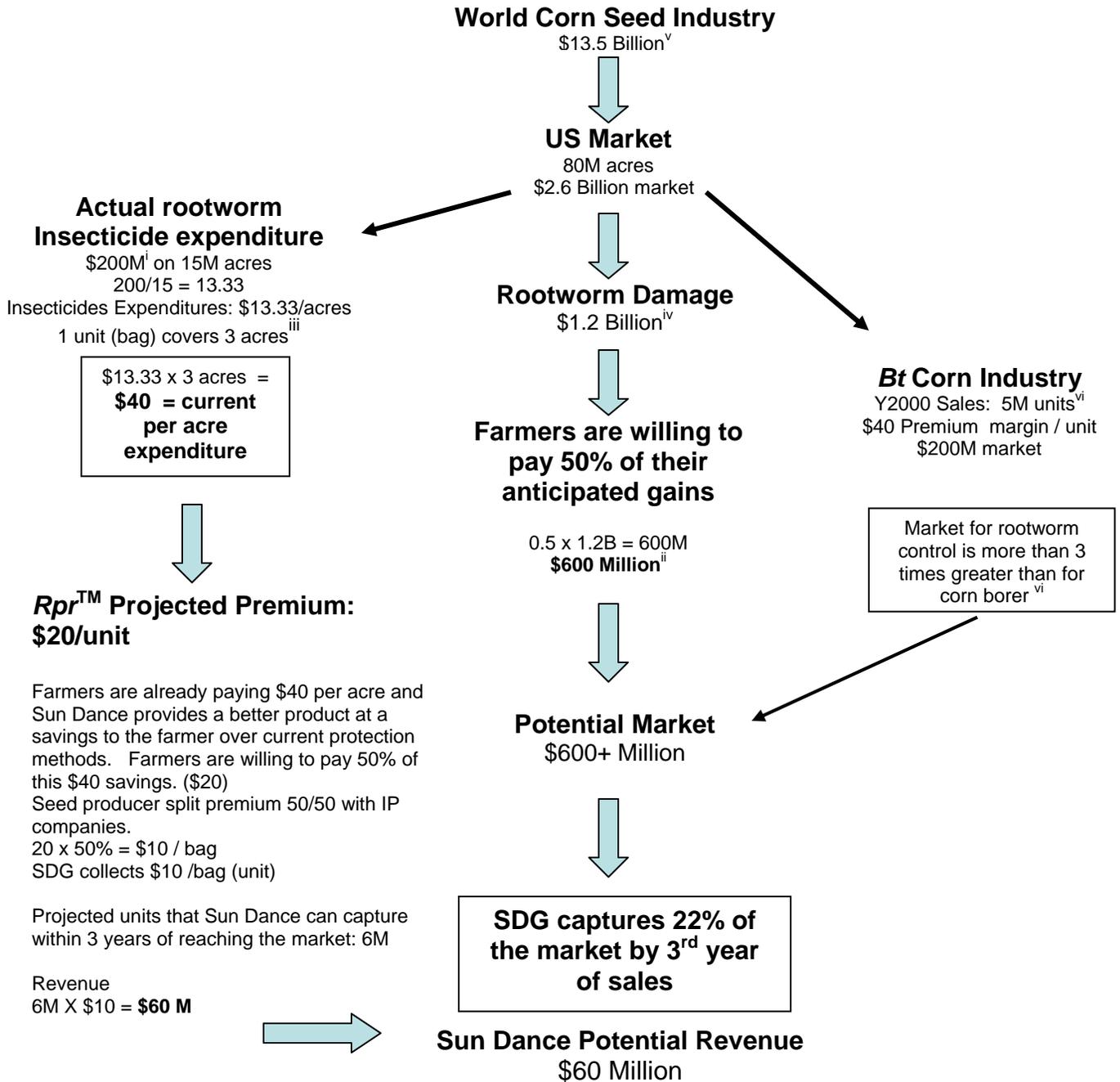
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<sup>44</sup> E.P.A. 1998. Scientific Advisory Panel, Subpanel on *Bacillus thuringiensis* (*Bt*) plant-pesticides and resistance management, February 9-10, 1998. Docket No. OPPTS-00231.

<sup>45</sup> Ferber, Dan. “New Corn Plant Draws Fire From GM Food Opponents.” *Science*, 25<sup>TH</sup> February, 2000, vol. 287, Page. 1390.

<sup>46</sup> Illinois Corn Growers Association. The Illinois Corn Handbook 2000. Export Markets Section.

# INDUSTRY ANALYSIS AND BASIS FOR FINANCIAL ASSUMPTIONS



<sup>i</sup>. Lee, Thomas "Corn rootworm resistant corn moves closer to market." St Louis Post-Dispatch. July 23, 2001  
[http://www.biotech-info.net/closer\\_to\\_market.html](http://www.biotech-info.net/closer_to_market.html)

<sup>ii</sup>. National Corn Grower's Association, The World of Corn 2000. <http://www.ncga.com>

<sup>iii</sup>. <sup>1</sup> One unit plants approximately 3 acres. National Corn Growers Association. World of Corn 2001.  
<http://www.ncga.com/03world/main/index.html>

<sup>iv</sup>. Lee, Thomas "Corn rootworm resistant corn moves closer to market." St Louis Post-Dispatch. July 23, 2001  
[http://www.biotech-info.net/closer\\_to\\_market.html](http://www.biotech-info.net/closer_to_market.html)

<sup>v</sup> Seed Statistics, The U.S. seed industry accounts for about 20 percent of this market, American Seed Trade Association,  
[http://www.amseed.com/about\\_statistics.asp](http://www.amseed.com/about_statistics.asp)

<sup>vi</sup> NSF/SBIR Phase II/IIB Award No. 9830138 Final Report, Investigation of novel genetic resources for rootworm

The \$200 million spent annually to treat 15 million infested acres with insecticides can quantify the market of these early adopters. These farmers are spending an average of \$13.33 an acre to treat the affected areas.<sup>47</sup> Since one unit (bag) of seed plants three acres of corn, farmers are paying the equivalent of \$40 per unit to protect against rootworm infestations. Given the extent of this problem, seed producers will be able to easily exact premiums of \$20 per unit or more. This premium is in line with the average price increases associated with other agricultural products using transgenic methods.<sup>48</sup> Since it is common for producers and technology companies to split the increased margin, the result is \$10 per unit in royalty revenue to Sun Dance Genetics for every bag sold that contains our proprietary technology. The most recent introduction of an insect resistant trait, *Bt* corn for protection against corn borer, came on the market in 1996. In the first year, approximately 1 million units of seed were sold. In 1997, approximately 3 million units were sold, and the following year, sales rose to 5 million units. It took only three years for *Bt* corn to saturate the entire affected area for this pest problem in the US. Rootworm has the potential to affect any acre and is already a \$1.2 billion problem. Using the *Bt* model and taking the percentage of what farmers would be willing to spend to capture those losses, the projected market potential is \$600 million plus.

#### Revenue Distribution (for one unit of seed)

Production Cost, Conditioning Cost and Transportation	45%
Producer Margins	55% <sup>49</sup>
One unit of transgenic hybrid corn seed	\$100-125.
One unit of conventionally produced hybrid corn seed	\$75-100

#### Future Trends and Opportunities

Farmers who use crop rotation to ward against rootworm infestation are considered late adopters in our model because they avoid much of the direct expenses that result from insecticide purchases. These farmers rotate between corn and soybeans from season to season. For years this strategy was an effective rootworm management system because the rootworm eggs could not survive in soy fields. In recent years, the insect has adapted and now lays eggs in non-corn fields where they remain dormant until the corn crop is planted the next season. In some cases, these new rootworms have remained viable for two or more years waiting for favorable conditions and the replanting of a corn crop.<sup>50</sup>

The Sun Dance rootworm resistance product could motivate these more traditional, late adopting farmers to buy into the Sun Dance technology. This increased demand will also drive seed producers to license our product more swiftly to meet this increased demand and gain valuable market share from companies that do not have a competitive product. Even if these developments do not accelerate the speed with which this product overtakes the market, it will ensure that a greater percentage of the potential total market eventually switches to Sun Dance root-protected technology. This will result in excellent long-term revenue potential for Sun Dance Genetics.<sup>51</sup> In addition to the anticipated market acceptance of rootworm protection technologies, Sun Dance projects its market penetration among the small and medium sized producers will allow us to target the larger producers as late adopters. If we can establish good market penetration, the larger seed producers may be inclined to license our products in order to provide their customers with the full array of rootworm management options. Through research and development, Sun Dance Genetics plans to stay ahead of the market by bringing an array of new and improved traits to the corn industry. While our initial product will be the release of our root-protected

<sup>47</sup> Karr, Doyle. "Pioneer Hi-bred Advances Corn Rootworm Resistant Hybrids Toward Marketplace." Pioneer Press Release. March 30<sup>th</sup>, 1999. [http://www.pioneer.com/pioneer\\_news/press\\_release/archives\\_99/corn\\_rootworm\\_resistant\\_hybrids\\_99.htm](http://www.pioneer.com/pioneer_news/press_release/archives_99/corn_rootworm_resistant_hybrids_99.htm) note: \$200 million divided by 15 million acres = \$13.33/acre there are even reports of farmers paying \$16-17 an acre in insecticides

<sup>48</sup> Karr, Doyle. "Pioneer Hi-bred Advances Corn Rootworm Resistant Hybrids Toward Marketplace." Pioneer Press Release. March 30<sup>th</sup>, 1999.

<sup>49</sup> Sun Dance royalties come from the margins.

<sup>50</sup> McLeod, Murt and DeFelice, Michael. "Corn rootworm I: Biology and Management." Crop Management and Agronomics: Crop Insights vol. 9 no. 7: 1999. note: Crop Insights is put out by Pioneer Hi-Bred

<sup>51</sup> All revenue projections based on US market. Considerable future opportunity exists in foreign markets as rootworm has recently spread to the EU and could expand its reach throughout the eastern world.

rootworm resistance, we plan to use our platform technology to bring more new products onto the world market.

### **International Market for Rootworm**

While the US is our initial target market, there are significant world markets into which Sun Dance germplasm would eventually expand. Europe is one such potential market and will welcome our product since the EU has strict anti-GMO regulations. Our environmentally friendly seed will enable European countries to meet their goal of reducing use of agricultural chemicals and avoiding GM products. The European Union (EU) plants 10 million acres of corn annually. Eastern Europe plants 17.4 million acres annually.<sup>52</sup> Corn rootworm has recently spread to Europe via imports and is now rapidly spreading and is expected to eventually affect all of these millions of acres. It has already spread to Romania, Bosnia-Herzegovina, Bulgaria, and Italy.<sup>53</sup> By the time Sun Dance Genetics rootworm resistance reaches the market, corn rootworm will have spread throughout Europe. The European Union will be targeted by Sun Dance through licensing to U.S. seed producers who export to Europe as well as European corn seed producers. Since all imports of transgenic material into the EU is severely restricted, the U.S. seed producers will be looking for a non-genetically engineered rootworm protection product to sell in Europe. Mexico plants 19 million acres of corn annually and would be a third international target for Sun Dance licensing agreements. Other potential international markets include Brazil, Canada, India, Asia, Argentina, South Africa, and Australia.

### **International Market for Drought Resistance**

World acreage outside of the U.S. is 256 million. A conservative estimate increase of 10 bushels equals a 2 billion bushel increase. Given that world prices range from \$1-3 per bushel, Sun Dance has conservatively estimated foreign prices of \$1 per bushel. If average foreign farmers were willing to pay the industry standard 25%-50% per bushel increase, this would amount to 0.25 cents per bushel. Multiplying 0.25 cents per bushel times a 2 billion bushel increase in yield opens up a \$640 million market. Combining this \$640 million foreign market with the U.S. drought resistance market gives a total world market for the Sun Dance drought resistance trait of \$1.2 billion.

### **Target Market Share and Market Distribution**

Having established the size of the potential rootworm market, it is important to consider Sun Dance's target market penetration levels. Over our first three years on the market, we project we can capture royalties on 10% of \$600 million total market of the rootworm resistant sales. This has been factored by using the market penetration of *Bt* corn as a model and also based on the EPA's refuge requirements, which set a precedent for 20% of fields to be required to be planted with non-genetically engineered crops. This market penetration would be achieved through aggressive licensing to the middle and lower level seed producers who represent 40% of seed sales. Companies such as Pioneer (35-40% of the seed market), Monsanto (10%), and Mycogen (10%) will be targeted as second-tier adopters who would license Sun Dance technology in order to provide their customers with the full range of environmental stress and pest-resistance strategies.<sup>54</sup> Therefore, these other companies are in one sense our customers because they would potentially license Sun Dance technology. In another sense their transgenic products offer potential sources competition to the Sun Dance XXX™ product. While some of these companies are listed under the competition section, they are not necessarily to be thought of as competitors. See Appendix I, for a letter from XXX Vice President of Research and Technology expressing interest in licensing a rootworm resistance product from Sun Dance Genetics.

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<sup>52</sup> United States Department of Agriculture. USDA-NASS *Agricultural Statistics 2001* [http://www.usda.gov/nass/pubs/agr01/01\\_ch1.pdf](http://www.usda.gov/nass/pubs/agr01/01_ch1.pdf)

<sup>53</sup> Enserink, Martin. "Biological Invaders Sweep In." *Science*, Vol. 285, 5435, pp. 1809-2020, Sept. 17, 1999.

<sup>54</sup> For details on the current market alliance, see the Alliance Chart. Note: Monsanto also collects royalties from an additional 20% of seed sales; mainly Roundup Ready varieties.

## COMPETITION

There are no other published reports of a comparable genetic bridge technology for corn improvement. While there are no competing platforms there would be competition on a product by product basis. Sun Dance Genetics has a monopoly on genetic transfers from technology involving *Tripsacum* and teosinte.

### Competing Strategies for Rootworm Resistance

#### Insecticide Based

Insecticide may cause health risk and environmental damages. Rootworms can and do develop resistance to the chemicals. In fact, according to the Illinois Department of Natural Resources, western corn rootworms have developed a 1,000-fold resistance to the most common insecticides.<sup>55</sup>

##### ▪ **Insecticide application**

- Costs farmers the equivalent of \$40 per unit in direct chemical costs.
- This method is one of only two currently available options, but farmers desire safer, cheaper, and more convenient alternatives

##### ▪ **Syngenta**

- Insecticide coating on seeds
- This product provides convenience, but still relies on highly toxic chemicals.
- Rootworm adaptability has demonstrated that insecticide based models do not have longevity.

#### Crop Rotation

This management technique proved valuable for decades, then the rootworm mutated. This new variety is capable of circumventing crop rotation by laying its eggs in non-corn crops. These eggs then lay dormant until corn is replanted in future years. As this new rootworm continues to spread crop rotation will become increasingly ineffective.<sup>56</sup>

#### Transgenic Solutions

The genetically engineered alternatives, which have yet to hit the market, base their protection on a single defense strategy. Regulators have placed this classification of products on hold because of concerns that insects will rapidly mutate, becoming resistant to these products.

##### ▪ **Monsanto**

- MaxGuard (MON863)
- This product is being held up by the EPA for testing on fears that the increased levels of *Bt* toxin will have adverse effects on the environment and that it could lead to super-resistant rootworms.<sup>57</sup>
- Also stacked-trait MaxGuard and YieldGuard (*Bt* for corn borer) products

##### ▪ **Pioneer**

- Attempting to develop transgenic rootworm resistance products, but no definite timeline for release to market has been established
- Pioneer is waiting for its first experimental use permit for a product developed using transgenic methods, update as of 4/6/2001<sup>58</sup>
- Dow and Pioneer have a research partnership that ends in 2005 for the development of corn rootworm and other resistances.<sup>59</sup>

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<sup>55</sup> Levine, Eli and Gray, Michael. Center for Economic Entomology Rootworm Problems in First-year Corn: an Update. INHS Reports May-June 1996. <http://www.inhs.uiuc.edu/chf/pub/surveyreports/may-jun96/rootworm.html>

<sup>56</sup> Ferber, Dan. "New Corn Plant Draws Fire From GM Food Opponents." *Science*, 25<sup>TH</sup> February, 2000, vol. 287, Page. 1390.

<sup>57</sup> . [http://www.biotech-info.net/zap\\_rootworm.html](http://www.biotech-info.net/zap_rootworm.html)

<sup>58</sup> <http://www.plant.uoguelph.ca/safefood/archives/agnet/2001/4-2001/ag-04-08-01-01.txt>

<sup>59</sup> Source Pioneer Press Release Archives

Both Monsanto's and Pioneer's future products have a similar weakness. Unlike XXX™ they do not provide a co-evolved defense mechanism for combating rootworm infestations.

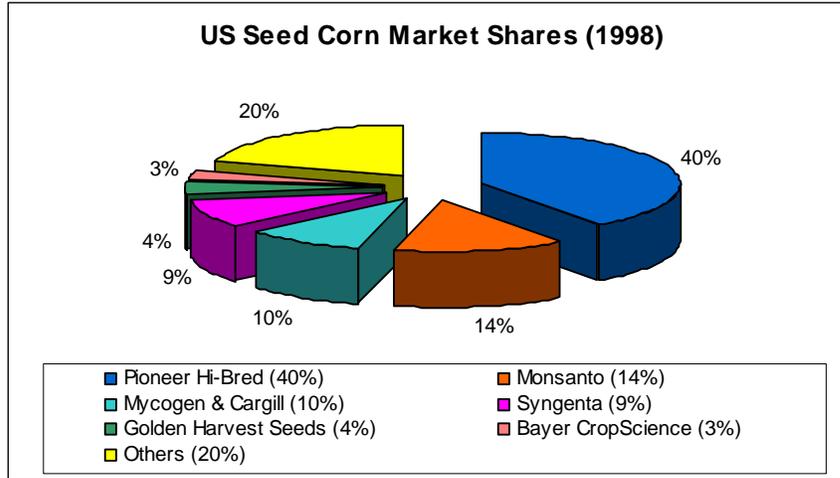
### **Differentiation**

Our product can be differentiated from other rootworm management strategies because it offers a different form of defense. The *Bt* plant-incorporated insecticide approach introduces high levels of *Bt* toxin throughout the plant. The fault in this method is that rootworms have demonstrated a 1000-fold increase in their resistance to insecticides.<sup>60</sup> Such adaptability by the insect could render GMO products obsolete in a relatively short period of time. The resistance being transferred from gamagrass is largely a non-preference effect resulting in minimal feeding on the roots. In fact, some herbivory actually seems to benefit Sun Dance plants by stimulating root growth, which allows the plant to flourish during infestation. This limited feeding appears to actually benefit the plants growth potential including yield increases in some lines. As noted above rootworm resistance to chemical pesticides has increased dramatically over the years, thus necessitating the use of stronger and more toxic chemicals creating a significant threat to the environment. Potential risks to human health and the environment due to the genetically engineered alternatives' increasing of the *Bt* toxin levels in all parts of the plant are not yet known. Furthermore, our product possesses the advantages associated with traditional breeding methods. These include lower production costs, and no regulatory review. All of these differentiating factors and benefits are tied to our proprietary technology platform. As a result, Sun Dance is committed to developing additional traits that will add value to our product lines and further differentiate them from those of other seed producers. See Appendices I and II, for letters from XXX Vice President of Research and Technology expressing interest in licensing drought resistance and rootworm resistance products from Sun Dance Genetics.

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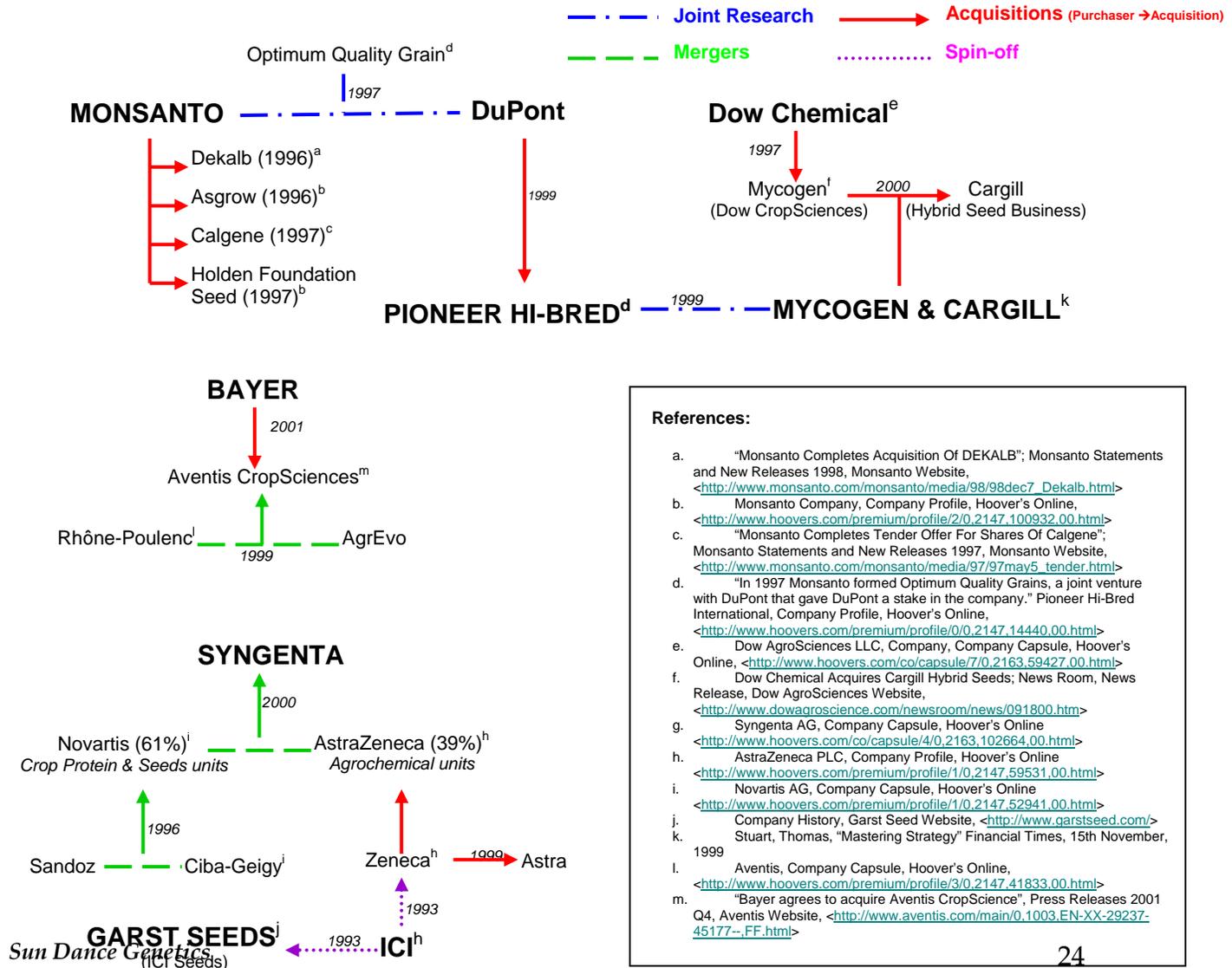
<sup>60</sup> Levine, Eli and Gray, Michael. Center for Economic Entomology Rootworm Problems in First-year Corn: an Update. INHS Reports May-June 1996. <http://www.inhs.uiuc.edu/chf/pub/surveyreports/may-jun96/rootworm.html>

# US Seed Corn Companies and Alliances



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## Consolidation in the Market



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## **FINANCIAL MODEL: Sun Dance Genetics**

APPENDIXES III through VI illustrate the four basic financials for Sun Dance Genetics. These include the Financial Sheet, the Balance Sheet, the P&L Statement and the Cash Flow Statement. As can be inferred from the figures, Sun Dance Genetics would need to raise funding of \$4 million in total VC financing which will be invested primarily in research and development. This funding would bring us through Milestone 2 and allow licensing agreements to be entered into with seed producers. The estimated time line for bringing our product to market is expected to be 1-3 years. Throughout this process, our scientists will continue their research and development efforts to ensure that we put forth the best possible product. Once our technology is licensed to seed producers, Sun Dance Genetics will collect milestone payments and then royalties. As a result of this royalty model, Sun Dance expects expenses to remain at a low level even as total sales increase.

### **Market and Sun Dance Revenue for Rootworm trait (at a glance)**

Years	2005	2006	2007
Acres planted <sup>61</sup>	9 million	27 million	45 million
Total units sold <sup>62</sup>	3 million	9 million	15 million
Units from which SD receives royalties	500,000	3 million	6 million
SD market share (%)	2%	11%	22%
SD premium / unit <sup>63</sup>	\$10	\$10	\$10
SD est. revenue	\$5 million	\$30 million	\$60 million

### **Market and Sun Dance Revenue for Drought Tolerance trait (at a glance)**

Years	2005	2006	2007
Acres planted <sup>64</sup>	6 million	15 million	30 million
Total units sold <sup>65</sup>	2 million	5 million	10 million
Units from which SD receives royalties	1 million	3 million	7 million
SD market share (%)	4%	11%	26%
SD premium / unit <sup>66</sup>	\$15	\$15	\$15
SD est. revenue from drought	\$15 million	\$45 million	\$105 million

Total SD est. revenue	\$20 million	\$75 million	\$165 million
Total SD est. expenses	\$1 million	\$1 million	\$1 million

Our revenue growth is driven by two factors: overall growth of the market segment, and annual increases in market share. Market penetration should continue to increase steadily as the market moves beyond the early adopting pesticide users and begins to expand towards the rest of the 74 million

<sup>61</sup> Expansion is based on *Bt* corn for corn borer resistance; corn rootworm is known to be a much more serious and widespread insect pest problem than corn borer.

<sup>62</sup> One unit plants approximately 3 acres. National Corn Growers Association. World of Corn 2001. <http://www.ncga.com/03world/main/index.html>

<sup>63</sup> Farmers currently spend \$13.33 an acre on insecticides, which equals the equivalent of \$40 per unit (bag). We project the total per bag premium for rootworm resistant seed will be \$20, of which Sun Dance will garner 50%.

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<sup>66</sup> Farmers currently spend \$13.33 an acre on insecticides, which equals the equivalent of \$40 per unit (bag). We project the total per bag premium for rootworm resistant seed will be \$20, of which Sun Dance will garner 50%.

rootworm-affected acres. For the first three years we use the introduction of *Bt* corn for the corn borer pest as a model. As none of the in-plant protection products are currently on the market this industry segment is poised for dramatic growth. Three factors will sustain this growth for the foreseeable future: demand for alternatives to the insecticide and crop rotation methods currently employed; the spread of rootworm infestations in Europe; and increasing world demand for corn as animal feed. Sun Dance Genetics has further assurance of reaching the third year market projections because of the refuge acre requirements of 20% instituted by the EPA. These refuge acres represent the absolute minimum estimate of market size and provide a reason for the major companies to license the Sun Dance product to complement their GMO products. These acres represent a market share for which Sun Dance Genetics has no competitors because these acres cannot be planted with genetically engineered corn. This amount of acreage is planted with 5 million bags and corresponds to a minimum of \$50 million in revenue.

**Personnel Costs:**

Sun Dance Genetics will be co-headed by XXX (CEO) and Dr. Mary Eubanks (President and Chief Scientific Officer). The focus of Sun Dance Genetics over the first two years is research and development all other expenses are at the minimum level required to support this phase. Once the second and third milestones have been achieved business and market development issues increase in importance. Three teams will be built to facilitate operations. There will be an administrative team, a business development team, as well as a product development team. Sun Dance Genetics has designed an attractive incentive system for employees including performance-based bonuses of up to 5% will be awarded. All officers and employees of Sun Dance Genetics will be offered equity positions in the form of a stock option plan in the company in exchange for somewhat lower salaries initially. The salary structure for each of these individuals has been attached below:

<b>Salary Costs (annual):</b>	<b>Salary</b>	<b>Department</b>
CEO (1)	\$ 95,000	Executive
Dr. Mary Eubanks (1)	\$ 95,000	Executive
Business Development Team (2 Full-time, and 3 Part-time)	\$150,000	Sales and Marketing
Tech Specialist (2 at \$35,000 each)	\$70,000	Product Development
Post Doctorate (1)	\$45,000	Product Development
Executive Assistant (1)	\$30,000	Administrative
Book keeper (1)	\$30,000	Administrative
Receptionist (1)	\$26,000	Administrative
<b>Total Annual Salary Expenditures</b>	<b>\$541,000.00</b>	

**Research Costs (annual):**

Lab and Office Space	\$20,000
Laboratory Consumables	\$20,000
Greenhouses	\$36,000
Patent Prosecution and Maintenance	\$50,000
<b>Total Annual Research Costs</b>	<b>\$126,000.00</b>

All cost figures start from year 1 of operations.

**One Time Capital Expenditures:**

Lab Machines (2 @ 25,000 ea.)	\$50,000
Computers (10 @ 2,500 ea includes necessary software)	\$25,000
<b>Total One time Capital Expenditures</b>	<b>\$75,000</b>

Amount needed to reach market	<b>\$4 million</b>
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This amount factors in all additional expenses, taxes, raises, etc, which are detailed in the full financial tables. The summaries of these tables are printed below and condensed down onto a yearly basis.

Sun Dance Genetics is seeking first round funding to complete the research and development and begin commercialization. Sun Dance expects this to be a three-year process at the cost of \$4 million and would bring Sun Dance through Milestone 3. If the R&D proceeds as projected, the state of our knowledge of the XXX™ trait will be one of confidence (the technical risks will have been eliminated), and there will be several options to fund the business until the revenue stream is adequate. Some of these mechanisms could provide an earlier exit strategy for a portion of the venture investment.

## **Risks**

The focus of Sun Dance Genetics over the first two years is research and development. Outside funding insures that the necessary R&D can be done in a timely way. The focus of Sun Dance Genetics over the first two years is research and development all other expenses are at the minimum level required to support this phase. Once the second (and third) milestones have been achieved business and market development issues increase in importance.

As with any company still in the research stage of product development there are certain risks. As a matter of due diligence some of the inherent risks in this business venture are listed below. Despite the positive indications provided by scientific work to date it is possible that currently unrecognized scientific obstacles might prevent the successful development of the product. There is a risk that not enough financing will be available to maintain the continued operation of the business. Good strategic positioning in no way guarantees that Sun Dance Genetics can achieve its projected market penetration or licensing terms. There have never been profits or revenue and the risk exists that neither will ever be realized. It is possible that future targeted traits will not pass properly to modern corn. It is possible the regulatory guidelines will change making our product obsolete or unprofitable. There is no assurance that the market will develop as anticipated. Sun Dance Genetics may not be able to retain key executives, Board members, or future clients. Further, this company may become embroiled in legal proceedings with regards to proprietary rights. Sun Dance Genetics plans to carry product liability insurance when adequate funds are available. This document in general contains forward-looking statements and these future events cannot be guaranteed. Potential investors must realize that the statements herein cannot be in anyway construed as a guarantee of future events or future financial returns.

## **EXIT PLAN**

The company understands the importance of providing liquidity for investors. In the biotechnology industry, investors are usually able to take profit in two ways: either the startup goes public or is acquired by another company. Either one of these scenarios is a likely prospect for Sun Dance Genetics. The predicted exit point would be in 2004, after Milestone 2 has been achieved and as Sun Dance is entering into licensing agreements, but before any product has come to market. We will examine several biotechnology companies in both scenarios, and compare their performance with Sun Dance Genetics' financial projections.

## **Initial Public Offering (IPO)**

Some biotechnology companies that went public in the last 5 years are:

*Paradigm Genetics*<sup>67</sup> (PDGM) determines the functions of specific genes (mainly for agricultural purposes). Its GeneFunction Factory technology uses an assembly-line approach to discovering gene functions, while its FunctionFinder bioinformatics database is a repository for what is discovered. Paradigm's revenue sources include an agreement with Bayer to develop herbicides, a partnership with Monsanto focused on crop protection and nutrition, and a grant from the US Department of Energy.

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<sup>67</sup> Paradigm Genetics, Company Capsule, Hoover's Online, <http://www.hoovers.com/co/capsule/0/0,2163,99950,00.html>

*Agritope*<sup>68</sup>, now Exelixis Plant Sciences, and a subsidiary of Exelixis, Inc., the company once concentrated on developing genetically modified fruit. Under its new ownership, it now focuses on plant genomics (identifying plant DNA sequences and identifying specific genes and their functions).

*Maxygen*<sup>69</sup> (MAXY) is focusing on directed molecular evolution. Its DNASHuffling recombination technology and MaxyScan screening systems are used to develop genes for commercial use. Its MolecularBreeding technology combines biotech advances with traditional breeding techniques, mimicking natural evolution processes to make products for vaccines, genetically engineered crops, and new energy sources. GlaxoSmithKline owns about 20% of the firm.

	<b>Paradigm Genetics</b>	<b>Agritope</b>	<b>Maxygen</b>
Ticker	PDGM	Acquired by Exelixis	MAXY
Date went public or acquired	May 5, 2000	Dec 29, 1998	Dec 16, 1999
Nasdaq Biotechnology Index @ offering date <sup>70</sup>	1018.24	421.71	695.24
Offering Price	\$7.00	\$7.00	\$16.00
Shares offered (Million)	6.0	1.34	6.0
Offering amount (Million)	\$42	\$9.4	\$96
Post-offering shares (Million)	24.962	4.2	29.4
Market Capitalization (Million)	\$174.72	\$29.4	\$470
Price/Sales Ratio <sup>71</sup>	2.36	12.8	13.64
Revenue before IPO	1999: \$2.2 million	1998 2Q: \$238,000	1999: \$14 million
Earnings before IPO	\$ (10.6) million	\$ (1.2) million	\$ (11.4) million

Sources: Hoover's Online, [www.hoovers.com](http://www.hoovers.com)

### **Mergers and Acquisitions:**

The other way for investors to take their profits is by selling the company to a third party. Since additional research and development will be done and the company will be closer to the market, Sun Dance Genetics will increase its value over time.

*Calgene, Inc*<sup>72</sup> was known for developing the world's first genetically altered tomato before it was acquired by agrochemical company Monsanto. The deal was completed in 1997 and was valued at about \$240 million. The Davis, California-based company also developed genetically modified plants and plant products (edible and industrial plant oils such as canola and cotton) for the food, seed and oleo-chemical industries. Calgene's last reported revenues were \$70.5 million in fiscal year 1996.

*Mogen International* is a plant biotechnology company. It uses genetic modification to develop crops with improved characteristics and licenses such advances and related patent rights to market partners around the world. Mogen has successfully demonstrated a high level of resistance in genetically modified carrot plants against four major fungal pathogens, promising broad-spectrum and durable fungal resistance. Zeneca, then UK's third largest drugs and agrochemicals group, spent £46 million (USD 73.6

<sup>68</sup> Exelixis Plant Sciences, Company Capsule, Hoover's Online, <http://www.hoovers.com/co/capsule/4/0,2163,54464,00.html>

<sup>69</sup> Maxygen Inc, Company Capsule, Hoover's Online < <http://www.hoovers.com/co/capsule/5/0,2163,61815,00.html>>

<sup>70</sup> Nasdaq Biotechnology Index Historical Data, <http://dynamic.nasdaq.com/dynamic/IndexChart.asp?drill=F&symbol=IXBT&desc=Nasdaq+Biotechnology&site=NASDAQ&sec=NASDAQ&months=60>

<sup>71</sup> Based on the closing price on April 9, 2002

<sup>72</sup> Calgene Inc Profile, Hoover's Online, <http://www.hoovers.com/premium/profile/boneyard/1/0,5034,12871,00.html> (2/20/02)

million) to acquire the plant biotechnology company in 1997. Mogen generated profits of £67,000 (USD 107,200) on sales of £4m (USD 6.4 million in fiscal year 1996).<sup>73</sup>

**PBIC** (Plant Breeding International Cambridge Limited) produces new and improved varieties of agricultural crops and markets them through a network of associated companies and agents worldwide. PBIC has established breeding programs for several crops, including winter wheat, barley, oilseed rape and potatoes. These efforts are aimed at developing crops that offer farmers higher yields, better quality, improved disease resistance and lower production costs. The company was formed in 1987 when Unilever acquired the breeding and applied science resources of the Plant Breeding Institute and the National Seed Development Organization from the U.K. government. Monsanto Company acquired PBIC from Unilever for £320 million (USD 525 million) in 1998.<sup>74</sup>

### **Company Valuation**

In the biotechnology industry, investors are usually able to take profit in two situations: either the startup goes public or is acquired by another company. Either one of these scenarios is a likely prospect for Sun Dance Genetics. In determining the company valuation, Sun Dance has used a revenue multiple of 3, which is common in the agricultural biotechnology industry.<sup>75</sup> Using this multiple and Sun Dance Genetics' third year combined trait revenue of \$165 million puts the company valuation at \$495 million. The predicted exit point would be in 2004, after Milestone 2 has been achieved and as Sun Dance is entering into licensing agreements, but before any product has come to market.

### **MARKETING PLAN**

The Sun Dance Genetics' marketing strategy focuses on enhancing, promoting, and supporting our platform technology. XXX™ our rootworm protection product and drought resistance represent a business based on royalty bearing licenses. Since these products address some of the biggest problems in the corn industry Sun Dance will market itself as a full-scale environmentally friendly solution. Our initial market focus is to establish a presence in the corn industry and thus develop meaningful contacts and partnerships that will lend themselves to future licensing deals. Our target market will initially focus on small to medium size seed producers. Sun Dance Genetics will provide these firms with the technological tools needed to remain competitive in this budding market segment. Our product will help solve a pressing problem within the corn industry and also provide a formidable strategic opportunity to our partners. Farmer insurance companies may also be willing to partner with Sun Dance Genetics. Insurance companies should be willing to help when they see that we are trying to develop a product, which will cut the amount of money they pay out annually in drought insurance. Further, these insurance companies might be interested in funding our research and structuring a deal where their farmers need to use our product or would charge less to farmers who buy seed with Sun Dance Technology because it lowers their risk. There is a natural synergy between farm insurance companies and Sun Dance Genetics, which will be explored in detail.

### **Sales Strategy**

Seed producers are motivated to license Sun Dance technology because it allows them an immediate way to increase seed sales and total revenue as well as enter new markets without having to spend money on research and development. The revenue projections Sun Dance Genetics uses are the exact same revenue projections seed producers would gain from licensing Sun Dance Genetics' germplasm.

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<sup>73</sup> Green, Daniel. "Zeneca to pay £46m for Mogen" *Financial Times* 4<sup>th</sup> May 1997, COMPANIES AND FINANCE: UK; Pg. 32

<sup>74</sup> "Monsanto Agrees To Acquire Plant Breeding International Cambridge From Unilever" Statements and News Releases 1998, Monsanto Website, < [http://www.monsanto.com/monsanto/media/98/98jul15\\_PBIC.html](http://www.monsanto.com/monsanto/media/98/98jul15_PBIC.html)>

<sup>75</sup> Biotechnology Research Services, Hoover's Online <[http://www.hoovers.com/premium/comp\\_data/5/0,2151,61815,00.html](http://www.hoovers.com/premium/comp_data/5/0,2151,61815,00.html)>

XXX™ for rootworm protection and drought resistance are seasonal products. Corn purchases occur in the fall and/or spring prior to corn planting each year. However, since our target market is actually the seed producers, we will be able to negotiate licensing deals year round. This will allow our partners to plan for future production needs. This business is one of incremental growth in market share. Farmers are forced to purchase new seed annually. In general these consumers are loyal customers to their seed producers. With each new license Sun Dance should be able to grow its market share and reach its growth projections as a result of the compounding this effect purchasing cycle causes.

### **Sales methods**

Our sales strategy consists of negotiating licenses directly with the targeted seed producers. Our sales and marketing team will expend considerable effort in the gathering of qualified leads, as well as in market research. Other important tasks will include the development of future marketing strategies. This will allow our CEO to handle contract negotiations through direct (executive) sales. In addition, all technical and scientific support will be referred to our CSO and our knowledgeable technicians.

### **Marketing Communications Strategy**

Sun Dance plans to use its contacts throughout the industry both those from Board members and CEO XXX in conjunction with the following market communications plan to generate licensing agreements. Having brought similar technologies in the soybean industry to market through licensing models, CEO XXX has a history of commercializing new technologies. The seed producers who run breeding programs will be the first “early adopter” companies and have been targeted because results from their breeding programs will spread and drive the market demand. Some of these companies include Syngenta, Bayer Cropsciences, Garst, Golden Harvest Seeds, Fielder’s Choice, and Advanta. Next, the rest of the middle tier companies will be targeted. See Appendix I-II for letters from seed production companies who already would like to license Sun Dance technology.

**Objective:** In order to pique the interest of seed companies that would license XXX™ and drought resistance to add to their product line, Sun Dance Genetics plans to:

#### **Strategies**

1. Build Dr. Eubanks’ scientific reputation and established expertise in the area of corn germplasm, she will be considered an expert corn breeder who can build corn rootworm resistance into her novel hybrid. This positions Sun Dance Genetics as a credible company in the seed industry.
2. Develop awareness of Sun Dance Genetics among corn seed related media outlets. This will be done through development and distribution of news releases and position statements that help explain the uniqueness of Sun Dance Genetics new hybrid, and also through direct contact with journalists at industry events.
3. Cultivate relationships for Sun Dance Genetics with seed industry and farm-related business groups and organizations. These might include the American Seed Trade Association, banks, farm credit institutions, crop consultants, agriculture economists, and research universities.

#### **Tactics**

1. Write and produce a Sun Dance Genetics folder, designed to hold company literature and product information, including a Sun Dance Genetics white paper, fact sheet, brochure, and other supportive materials.
2. Offer Dr. Eubanks as a speaker at various conferences, symposiums, and meetings. Distribute white paper, fact sheets, and other information to attendees.
3. Create a Sun Dance Genetics web site.
4. Create a Sun Dance Genetics PowerPoint presentation to use with key influencers.
5. Develop a CD-ROM business card, designed to play in any computer CD-ROM, which includes PowerPoint presentation, fact sheets, and connects to the Sun Dance Genetics web site.
6. Utilize the American Seed Trade Association to exhibit our product at next annual meeting / conference.

7. Create a trade show display that highlights Sun Dance Genetics.

### **Prices and Margin Structures**

The prices for our products are based on the potential end user benefits as compared to what is already being expended. The prospect of native resistance will eliminate costs and improve the farmers bottom line. Our distributors, in turn, have a product that offers cutting-edge technology, using traditional breeding methods to offer protection comparable to that being developed through genetic engineering. As a result of these benefits our partners will be able to charge premiums of as much as \$40 per unit or more for seed lines containing the XXX™ technology and/or drought resistance. This will provide Sun Dance Genetics with premium-based royalties of at least \$10 per unit. In exchange for allowing these firms access to our proprietary germplasm they will also finance the marketing, distribution, and production of seeds containing Sun Dance's proprietary technology. These joint marketing opportunities will provide excellent exposure for our future product releases. As the market matures Sun Dance Genetics will consider instituting discounts that would attract late adopting seed producers to license our product. This would be done in attempts to garner increased market share and as a possible opportunity to sign license agreements with the top three seed producers. These firms might consider licensing our product as a way to ensure a full spectrum of product offerings. While this would affect our margins, such a move could ultimately prove viable if there is a significant increase in volume sold. Pricing strategies will need to be reviewed annually to reflect the changing market and the actions of other companies within the industry.

### **Distributors**

One of the key elements designed into Sun Dance Genetics' marketing plan is the targeting of our distributors. We will select distribution channels already in existence and staffed with professionals possessing appropriate backgrounds and clientele. Our products are very pertinent to the nature of seed producer's business and to the well being of their customer base. Also, given that we are targeting executives within the seed industry it is significantly less difficult for us to educate them about the benefits of using our technology. This strategic marketing approach takes full advantage of the fact that these professionals are already involved with parallel products and services combined with extensive market experience. By operating within these distribution channels we can more quickly capitalize on our technological advantage. In addition, we can generate significant market penetration while obtaining excellent sales results.

In many ways these partners act as original equipment manufacturers. We incorporate our technology into their product lines and they manage the testing, marketing and sales of the improved version. This allows Sun Dance Genetics to focus its energy on its scientific expertise. In the future, we may also decide to provide a private-label seed line, but the convenience and cost savings that result from working through established distribution channels are attractive for our start-up efforts. Through this relationship our scientists will provide technical support to our partners, who will in turn respond to the needs of the consumers.

### **Next steps**

Based on the Sun Dance Genetics' strategic plan, future action is dependent on exploring the companies various funding options. To date this firm has acted as a research endeavor. It is the desire of the founder, the CEO, the board and all Sun Dance employees that the company take the necessary steps to achieve a marketable product. To this end the most sensible financial recommendation includes the pursuit of VC funding. In this way Sun Dance can acquire the necessary capital to meet its remaining scientific milestones. The size and breadth of opportunity resulting from Sun Dance's platform technology, and the resultant pipeline of future products justifies projections of significant investor returns. This company's adaptive technology will allow it to adjust to the demands of an ever-changing marketplace.

**APPENDIX I:**

**Industry letter**

## **APPENDIX II**

### **Industry letter**