SENESCO TECHNOLOGIES INC
Form 10KSB
September 28, 2004

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-KSB

(Mark One)

ý ANNUAL REPORT UNDER SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934.

For the fiscal year ended June 30, 2004

OR

o TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934.

For the transition period from to

Commission File No. 001-31326

SENESCO TECHNOLOGIES, INC.

(Name of Small Business Issuer as Specified in Its Charter)

Delaware	**84-1368850**
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)
303 George Street, Suite 420, New Brunswick, New Jersey	**08901**
(Address of Principal Executive Offices)	(Zip Code)

(732) 296-8400
(Issuer s Telephone Number,
Including Area Code)

Securities registered under Section 12(b) of the Exchange Act:

Title of each class	**Name of each exchange on which registered**
Common Stock, $0.01 par value per share.	American Stock Exchange

Securities registered under Section 12(g) of the Exchange Act:

None.

Check whether the issuer: (1) filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act during the past 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes: ý No: o

Check if there is no disclosure of delinquent filers in response to Item 405 of Regulation S-B contained in this form, and no disclosure will be contained, to the best of registrant s knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-KSB or any amendment to this Form 10-KSB. ý

State issuer s revenues for fiscal year ended June 30, 2004: $16,667

State the aggregate market value of the voting common stock held by non-affiliates of the Registrant: $25,033,214 at September 20, 2004 based on the closing sales price on that date.

Indicate the number of shares outstanding of each of the Registrant s classes of common stock, as of September 20, 2004:

Class	Number of Shares
Common Stock, $0.01 par value	13,787,750

Transitional Small Business Disclosure Format:

Yes: o No: ý

The following documents are incorporated by reference into the Annual Report on Form 10-KSB: Portions of the registrant s definitive Proxy Statement for its 2004 Annual Meeting of Stockholders are incorporated by reference into Part III of this Report.

TABLE OF CONTENTS

PART I

Item 1. **Business.**

Our Business

The primary business of Senesco Technologies, Inc., a Delaware corporation incorporated in 1999, and its wholly-owned subsidiary, Senesco, Inc., a New Jersey corporation incorporated in 1998, collectively referred to as Senesco, we, us or our, is the research, development and commercial exploitation of a potentially significant platform technology involving the identification and characterization of genes that we believe control the programmed cell death of plant cells, also known as senescence, and human cells, also known as apoptosis.

Agricultural Applications

Our technology goals for agricultural applications are to enhance the quality and productivity of fruits, flowers, vegetables and agronomic crops by:

extending the shelf life of perishable plant products;

producing larger and leafier crops;

increasing yield in horticultural and agronomic crops; and

reducing the harmful effects of environmental stress and disease.

Senescence is the natural aging of plant tissues. Loss of cellular membrane integrity is an early event during the senescence of all plant tissues that prompts the deterioration of fresh flowers, fruits and vegetables. A decline in cell function ensues, leading to deterioration and eventual death, or spoilage, of the tissue. A delay in senescence increases shelf life and extends the plant s growth timeframe, which allows the plant to devote more time to the photosynthetic process. We have shown that the additional energy gained during this period leads directly to increased seed and starch production, and therefore increases crop yield. Seed production is a vital agricultural function. For example, oil-bearing crops store oil in their seeds. We have also shown that this reduction in premature senescence leads to larger plants, with increased biomass, and more leafy crops. Most recently, we have demonstrated that reducing premature senescence results in crops which exhibit increased resilience to water deprivation and salt stress and require less fertilizer. These crops may ultimately be more cost effective due to reduced loss in the field

and less time spent on crop management.

The technology presently utilized by the industry for increasing the shelf life in certain flowers, fruits and vegetables relies primarily on reducing ethylene biosynthesis, and hence only has application to the limited number of plants that are ethylene-sensitive. Our research focuses on the discovery and development of certain gene technologies, which are designed to confer positive traits on fruits, flowers, vegetables, forestry species and agronomic crops. To date, we have isolated and characterized the senescence-induced lipase gene, deoxyhypusine synthase, or DHS, gene and Factor 5A gene in certain species of plants. Our goal is to inhibit the expression

of, or silence, these genes to delay senescence, which will in turn extend shelf life, increase biomass, increase yield and increase resistance to environmental stress, thereby demonstrating proof of concept in each category of crop. We have licensed this technology to various strategic partners and have entered into a joint venture, and we intend to continue to license this technology to additional strategic partners and/or enter into additional joint ventures.

We are currently working with lettuce, melon, turfgrass, tomato, canola, Arabidopsis, a model plant that produces oil in a manner similar to canola, banana, alfalfa and certain species of trees and bedding plants, and we have obtained proof of concept for the lipase, DHS and Factor 5A genes in several of these plants. Our near-term research and development initiatives include silencing or reducing the expression of DHS and Factor 5A genes in these plants and propagation and testing of plants with our silenced genes. Also, we have ongoing lettuce and banana field trials with our respective partners. The first round of these field trials showed that our technology effectively reduces browning in cut lettuce and extends the shelf life of banana fruit by up to 100%.

Human Health Applications

Inhibiting Apoptosis

We have also isolated the DHS and Factor 5A genes in human cells. Our preliminary research reveals that these genes regulate apoptosis in mammalian, including human, cells. Our data has led us to believe that our technology has potential application as a means of controlling a broad range of diseases that are attributable to premature apoptosis. Apoptotic diseases include neurodegenerative diseases, ocular diseases, such as glaucoma and macular degeneration, heart disease, stroke and rheumatoid arthritis, among others.

We have commenced pre-clinical research on diseased heart tissue as well as cell-line studies to determine Factor 5A s ability to regulate key inflammatory cytokines and receptors, including Interferon gamma, Interleukin-1, Interleukin-18 and tumor necrosis factor alpha, or TNF-a, which are implicated in numerous apoptotic diseases. In addition, we have initiated cell-line studies for applications of our technology to glaucoma, intestines and liver cells. These preclinical tests have shown that Factor 5A appears to control expression of the suite of proteins required for apoptosis.

These proteins required for cell death include p53, interleukins, caspases, and TNF-a. Expression of these cell death proteins is required for the execution of apoptosis. We have found that blocking Factor 5A by treatment with small inhibitory RNA, or siRNA, inhibits the expression of p53, a major cell death transcription factor that in turn controls the formation of a suite of other cell death proteins. In addition, down-regulation of Factor 5A up-regulates Bcl-2, a major suppressor of apoptosis. Blocking Factor 5A also reduces the number of cells undergoing apoptosis. These data were collected in tests in human lamina cribrosa cells grown from human optic nerve heads and from human intestinal epithelial cells. The use of primary human cells and cell lines has direct application to development of treatments for both glaucoma and inflammatory bowel disease. By inhibiting Factor 5A, we were able to reduce TNF-a induced apoptosis by 80% in lamina cribrosa cells. TNF-a is strongly upregulated in the optic nerve head of the glaucomatous eye, and TNF-a induced apoptosis appears to be an important determinant of the progressive neurodegeneration characteristic of glaucoma. Thus, inhibition of

TNF-a induced apoptosis may reduce damage to the optic nerve during glaucoma. Crohn s disease can lead to apoptosis of intestinal epithelial cells and destruction of the lining of the bowel through production of cytokines, such as TNF-a. We have found that inhibition of Factor 5A in a human intestinal epithelial cell line not only protects these cells from cytokine induced apoptosis, but it also decreases production of TNF-a protein by 90%. This dual effect of our inhibitor of Factor 5A indicates that it could have therapeutic potential for patients suffering from inflammatory bowel disorders, such as Crohn s disease and ulcerative colitis.

In addition to this *in vitro* work, two pre-clinical mouse studies showed a reduction of inflammation and general protection of the immune system. In the first experiment, we pretreated mice intranasally with an inhibitor of Factor 5A and then introduced lipopolysaccharide, or LPS, a toxic agent that triggers inflammation through the immune system in response to bacterial infections. The mice that had been pretreated with the inhibitor of Factor 5A had approximately 90% lower levels of myeloperoxidase, or MPO, in their lung tissue, showing that inflammation of the lung was correspondingly reduced. MPO is a marker of inflammation and has been associated with inflammatory disease of organs such as the heart, lungs and bowels. Additionally, in the second experiment, we similarly pretreated mice with an inhibitor of Factor 5A and introduced LPS to induce inflammation and an immune system response. Under control conditions, LPS kills thymocytes, which are important immune system precursor cells created in the thymus to fend off infection. Senesco s technology allowed for approximately 90% greater survival of these thymocytes in the presence of LPS.

Accelerating Apoptosis

Conversely, we have also established in pre-clinical studies that our apoptosis Factor 5A gene is able to kill cancer cells. Tumors arise when cells that have been targeted to undergo apoptosis are unable to do so because of an inability to activate the apoptotic pathways. When our apoptosis Factor 5A gene was introduced into RKO cells, a cell line derived from human carcinoma and COS-7 cells, an immortal, cancer-like cell line from monkeys, virtually all cells expressing the Factor 5A gene underwent apoptosis. Moreover, just as the senescence Factor 5A gene appears to facilitate expression of the entire suite of genes required for programmed cell death in plants, the apoptosis Factor 5A gene appears to regulate expression of a suite of genes required for programmed cell death in mammals. For example, over-expression of apoptosis Factor 5A up regulates p53, an important tumor suppressor gene that promotes apoptosis in cells with damaged DNA and also down-regulates Bcl-2, a suppressor of apoptosis. Because the Factor 5A gene appears to function at the initiation point of the apoptotic pathways, we believe that our gene technology has potential application as a means of combating a broad range of cancers. We believe that our data in a mouse cancer model supports this theory. Preclinical studies using mice with the same genetic defect that causes lung cancer in humans showed that we can induce apoptosis in cancerous cells while leaving healthy cells unaffected. Factor 5A was injected into the blood stream of the mice, and the lung tissue was subsequently analyzed for apoptosis. The data show that the lung tumor cells were specifically targeted to undergo cell death while the surrounding healthy tissue was unaffected. There was no evidence of systemic toxicity in the mice as evidenced by no weight loss, mortality or any signs of abnormal apoptosis in any of the vital organs. We are now undertaking pre-clinical studies to ensure that systemically administered Factor 5A is non-toxic.

Agricultural Target Markets

Our technology embraces crops that are reproduced both through seeds and propagation, which are the only two means of commercial crop reproduction. Propagation is a process whereby the plant does not produce fertile seeds and must reproduce through cuttings from the parent plant which are planted and become new plants. In order to address the complexities associated with marketing and distribution in the worldwide market, we have adopted a multi-faceted commercialization strategy, in which we plan to enter into licensing agreements or other strategic relationships with a variety of companies or other entities on a crop-by-crop basis.

In November 2001, we entered into a worldwide exclusive development and license agreement with the Harris Moran Seed Company, referred to herein as the Harris Moran License, to commercialize our technology in lettuce and certain melons for an indefinite term, unless terminated by either party pursuant to the terms of the agreement. To date, the development steps performed by Harris Moran and us have all been completed on schedule in accordance with the protocol set forth in the Harris Moran License. There has been extensive characterization of our genes in lettuce in a laboratory setting. The initial lab work has produced genetically modified seed under greenhouse containment, which has been followed by substantial field trials for evaluation. These field trials represent a vital step in the process necessary to develop a commercial product, and we believe that these field trials have yielded data sufficient to initiate contact with potential marketing partners. Harris Moran has undertaken additional field trials of our technology in calendar 2003 and calendar 2004.

In June 2002, we entered into a three-year worldwide exclusive development and option agreement with ArborGen, LLC, referred to herein as the ArborGen Agreement, to develop our technology in certain species of trees. The ArborGen Agreement also grants ArborGen an option to acquire an exclusive worldwide license to commercialize our technology in various other forestry products. To date, the research being conducted by ArborGen has proceeded according to schedule. ArborGen has seen promising positive growth responses in greenhouse-grown trees. These initial greenhouse data led to the initiation of field trials by ArborGen in the second half of calendar 2004.

In September 2002, we entered into an exclusive development and license agreement with Cal/West Seeds, referred to herein as the Cal/West License, to commercialize our technology in certain varieties of alfalfa. The Cal/West License will continue until the expiration of the patents set forth in the agreement, unless terminated earlier by either party pursuant to the terms of the agreement. The Cal/West License also grants Cal/West an exclusive option to develop our technology in various other forage crops. The Cal/West development effort expects to incorporate our technology into their alfalfa plants by the spring of calendar 2005. Further greenhouse trait analysis will take place for the remainder of calendar 2004, with planned field trials beginning in the spring of calendar 2005.

In October 2002, we entered into a non-exclusive sales representative agreement to market and promote our technology in the People s Republic of China. Under the terms of the agreement, we will pay a commission to the sales representative based on a percentage of any gross license fees we may receive. With the assistance of the sales representative, in November 2002, we executed a non-binding letter of intent with the Tianjin Academy of Agricultural

Sciences for the exclusive use of our technology in a large variety of fruit and vegetable crops in China. Discussions have been held with representatives of the Academy as well as government representatives from the city of Tianjin and from the central government of China. We have also initiated discussions with several Asian biotechnology companies. Such a company would be necessary to secure the financing for the proposed agreement with the Academy and to commercialize the seeds developed with our technology under the proposed license. Because of the number of crops the Academy has expressed interest in, the letter of intent called for significant licensing and milestone fees to be paid to us by a commercial partner if the project were successful. The size of the proposed financial terms in the letter of intent have made attracting such a commercial partner difficult. As such, ongoing discussions with the Academy have been focused on possibly reducing the number of crops selected so that financial terms may be restructured. Additionally, discussions with some of these companies have focused on direct licensing opportunities that would not include the Academy.

In March 2004, we entered into an exclusive development and license agreement with The Scotts Company, referred to herein as the Scotts Agreement, to commercialize our technology in turfgrass and certain species of bedding plants. Scotts is working on incorporating our technology to enhance a variety of traits in these plants, including environmental stress resistance, disease resistance and enhanced bloom properties.

Human Health Target Markets

We believe that our gene technology could have broad applicability in the human health field, by either inhibiting or accelerating apoptosis. Inhibiting apoptosis may be useful in preventing or treating a wide range of inflammatory and ischemic diseases attributed to premature apoptosis, including heart disease, arthritis, ocular diseases, such as glaucoma and macular degeneration, and neurodegenerative diseases among others. Accelerating apoptosis may be useful in treating certain forms of cancer because the body s immune system is not able to force cancerous cells to undergo apoptosis.

Competition

Competitors that are presently attempting to distribute their technology have generally utilized one of the following distribution channels:

licensing technology to major marketing and distribution partners;

entering into strategic alliances; or

developing in-house production and marketing capabilities.

In addition, some competitors are owned by established distribution companies, which alleviates the need for strategic alliances, while others are attempting to create their own distribution and marketing channels.

Our competitors in the field of delaying plant senescence are companies that develop and produce transformed plants in which ethylene biosynthesis has been silenced. Such companies include, among others: Paradigm Genetics; Bayer Crop Science; Mendel Biotechnology; Renessen LLC; Exelixis Plant Sciences, Inc.; PlantGenix, Inc.; Syngenta International AG; and Eden Bioscience.

There are many large and development stage companies working in the field of apoptosis research including: Amgen; Centocor; Genzyme; OSI Pharmaceuticals, Inc.; Idun Pharmaceuticals; Novartis; Introgen Therapeutics, Inc.; Genta, Inc.; and Vertex Pharmaceuticals, Inc.

Marketing Program

We presently license our technology to agricultural companies capable of incorporating our technology into crops grown for commercial agriculture. We anticipate revenues from these relationships in the form of licensing fees and royalties from our partners. In addition, we anticipate payments from our partners upon our achievement of certain research and development benchmarks. This commercialization strategy allows us to generate revenues at various stages of product development, while ensuring that our technology is incorporated into a wide variety of crops. Our optimal partners combine the technological know-how to incorporate our technology into their product line along with the ability to successfully market the enhanced final product, thereby eliminating the need for us to develop and maintain a sales force. Based upon our commercialization strategy, we anticipate that there may be a significant period of time before plants enhanced using our technology reach consumers. Thus, we have not begun to actively market our technology directly to consumers, but rather, we have sought to establish ourselves within the industry through presentations at industry conferences, our website and direct communication with prospective licensees.

We plan to employ the same partnering strategy in both the human health and agricultural target markets. Our preclinical research has yielded data that we have presented to various biopharmaceutical companies that may be prospective licensees for the development and marketing of potential applications of our technology.

Research Program

Our subsequent research and development initiatives include: (i) further developing the DHS and Factor 5A gene technology in lettuce, melon and banana, and implementing the technology in a variety of other commercially important agricultural crops such as oil seed crops, turfgrass, bedding plants, tomato, alfalfa and trees; (ii) testing the resultant crops for new beneficial traits such as increased yield and increased tolerance to environmental stress; and (iii) assessing the role of the DHS and Factor 5A genes in human diseases through the accumulation of additional data from pre-clinical experiments with cell lines, mammalian tissue and animal models. Our strategy for agriculture focuses on various plants to allow flexibility that will accommodate different plant reproduction strategies among the different sectors of the broad agricultural and horticultural markets.

Our research and development is performed by third party researchers at our direction, pursuant to various research and license agreements. The primary research and development effort, which is performed by approximately 24 researchers that are funded in whole or in part by us, takes place at the University of Waterloo in Ontario, Canada, where the technology was discovered, the University of Colorado and two research hospitals in Toronto, Ontario. Additional research and development is performed by our partners in connection with the Harris Moran License, the Scotts Agreement, the ArborGen Agreement, the Cal/West License and the Anawah Agreement, referenced below, and through the Rahan Joint Venture, referenced below.

Joint Venture

On May 14, 1999, we entered into a joint venture agreement with Rahan Meristem Ltd., or Rahan Meristem, an Israeli company engaged in the worldwide export marketing of banana germplasm, referred to herein as the Rahan Joint Venture. Rahan Meristem accounts for approximately 10% of the worldwide export of banana seedlings. We have contributed, by way of a limited, exclusive, worldwide license to the Rahan Joint Venture, access to our technology, discoveries, inventions and know-how, whether patentable or otherwise, pertaining to plant genes and their cognate expressed proteins that are induced during senescence for the purpose of developing, on a joint basis, genetically enhanced banana plants which will result in a banana that has a longer shelf life. Rahan Meristem has contributed its technology, inventions and know-how with respect to banana plants. Rahan Meristem and Senesco equally own the Rahan Joint Venture.

The Rahan Joint Venture applied for and received a conditional grant that totals approximately $340,000, which constitutes 50% of the Rahan Joint Venture s research and development budget over the five-year period, ending on May 31, 2005, from the Israel - U.S. Binational Research and Development Foundation, or BIRD Foundation, referred to herein as the BIRD Grant. Such grant, along with certain royalty payments, shall only be repaid to the BIRD Foundation upon the commercial success of the Rahan Joint Venture s technology. The commercial success is measured based upon certain benchmarks and/or milestones achieved by the Rahan Joint Venture. The Rahan Joint Venture reports these benchmarks periodically to the BIRD Foundation**.**

All aspects of the Rahan Joint Venture s research and development initiative are proceeding on time, or are ahead of the original schedule laid out at the inception of the Rahan Joint Venture. Both the DHS and lipase genes have been identified and isolated in banana, and the Rahan Joint Venture is currently in the process of silencing these genes. The resultant plants are being tested in field trials to assess extended shelf life of banana fruit and enhanced tolerance to environmental stress and disease. The two Israeli field trials indicated that Senesco s proprietary technology extends the shelf life of the banana fruit up to 100%, while allowing the banana fruit to ripen normally. In addition, we believe that these field trials have yielded data sufficient to initiate contact with potential marketing partners.

Consistent with our commercialization strategy, we intend to attract other companies interested in strategic partnerships, joint ventures or licensing our technology. The Harris Moran License, the ArborGen Agreement, the Cal/West License and the Rahan Joint Venture are the first successes toward the execution of our strategy.

Intellectual Property

Research and Development

The inventor of our technology, John E. Thompson, Ph.D., is the Associate Vice-President, Research and former Dean of Science at the University of Waterloo in Ontario, Canada, and is our Executive Vice President and Chief Scientific Officer. Dr. Thompson is also one of our directors and owns 4.2% of the outstanding shares of our common stock, $0.01 par value, as of June 30, 2004. On September 1, 1998, we entered into, and subsequently have

extended, a research and development agreement with the University of Waterloo and Dr. Thompson as the principal inventor, referred to herein as the First Research and Development Agreement. The First Research and Development Agreement is currently set to expire on August 31, 2006. Also, effective May 1, 2002, we entered into another research and development agreement, for a period of one year, with the University of Waterloo and Dr. Thompson, referred to herein as the Second Research and Development Agreement. The First Research and Development Agreement and the Second Research and Development Agreement are collectively referred to herein as the Research and Development Agreements. The Research and Development Agreements provide that the University of Waterloo will perform research and development under our direction, and we will pay for the cost of this work and make certain payments to the University of Waterloo. In return for payments made under the Research and Development Agreements, we have all rights to the intellectual property derived from the research.

Effective May 1, 1999, we entered into a consulting agreement for research and development with Dr. Thompson. On July 1, 2001, we renewed the consulting agreement with Dr. Thompson for an additional three-year term as provided for under the terms and conditions of the agreement. On July 1, 2004, the agreement automatically renewed for an additional three-year term. In July 2004, Richard Dondero was hired as our Vice President of Research and Development allowing Dr. Thompson to become our Chief Scientific Officer.

In September 2002, we entered into an exclusive worldwide collaboration agreement with Anawah, Inc., formerly Tilligen, Inc., referred to herein as the Anawah Agreement, to establish a research alliance to develop and commercialize certain genetically enhanced species of produce. Under the Anawah Agreement, Anawah will license its proprietary technology to us and will also perform certain transformation functions in order to develop seeds in certain species of produce that have been enhanced with our technology. The Anawah Agreement will continue until the expiration of the patents set forth in the agreement, unless terminated earlier by either party pursuant to the terms of the agreement.

Our research and development expenses incurred on human health applications were approximately 43% for the fiscal year ended June 30, 2004 and approximately 47% for the fiscal year ended June 30, 2003. Since our inception the proportion of research and development expenses on human health applications has increased, as compared to plant applications. This change is primarily due to the fact that our research focus on human health has increased and some of our research costs for plant applications have shifted to our research partners.

Our future research and development program focuses on the discovery and development of certain gene technologies which intend to extend shelf life and to confer other positive traits on fruits, flowers, vegetables and agronomic row crops and on expanding our mammalian research programs. Over the next twelve months, we plan to continue the following research and development initiatives:

the development of plants that possess new beneficial traits, such as protection against drought, with emphasis on lettuce, melon, corn, forestry products, alfalfa and the other species described below with several entities, including Anawah;

the development of enhanced lettuce plants through the Harris Moran License;

the development of enhanced trees through the ArborGen Agreement;

the development of enhanced alfalfa through the Cal/West License;

the isolation of new genes in the Arabidopsis, tomato, lettuce, soybean, canola seed and melon plants, among others, at the University of Waterloo;

the development of enhanced banana plants through the Rahan Joint Venture;

the transformation of seeds enhanced with our technology;

the development of enhanced turfgrass and bedding plants through the Scotts Agreement; and

assessing the function of the DHS and Factor 5A genes in human diseases at the University of Waterloo and the University of Colorado.

We may further expand our research and development program beyond the initiatives listed above to include other research centers.

Patent and Patent Applications

On March 25, 2003, we were granted Patent No. 6,538,182, entitled DNA Encoding a Plant Deoxyhypusine Synthase, A Plant Eukaryotic Initiation Factor 5A, Transgenic Plants and A Method For Controlling Senescence and Programmed Cell Death in Plants , from the United States Patent and Trademark Office, or PTO. This patent represents successful prosecution of some of the claims set forth in the Second Patent Application, as defined below. Further divisional applications which cover other claims from the Second Patent Application are currently being reviewed by the PTO.

On August 10, 2004, we were granted Patent No. 6,774,284 entitled DNA Encoding A Plant Lipase, Transgenic Plants and A Method For Controlling Senescence In Plants , from the PTO. This patent represents successful prosecution of some of the claims set forth in the First Patent Application, as defined below. Further divisional applications which cover other claims from the First Patent Application are currently being reviewed by the PTO.

We have three major families of patent applications in process domestically and internationally. The first family of applications is based on the application entitled DNA Encoding a Plant Lipase, Transgenic Plants and a Method for Controlling Senescence in Plants , referred to herein as the First Patent Application, which was filed in February 1999. The second family of applications is based on the application entitled DNA Encoding A Plant Deoxyhypusine Synthase, Transgenic Plants and a Method for Controlling Cell Death in Plants , referred to herein as the Second Patent Application, which was filed in July 1999. We have filed several new Continuations in Part and Divisional Patent Applications on both the First Patent Application and the Second Patent Application to protect our intellectual property pertaining to new technological developments. We have also filed one additional application, referred to herein as the Third Patent Application, followed by a substantial Continuation in Part, in addition to those listed above, which pertain to the possible mammalian applicability of our technology. The Third Patent Application is focused on suppressing cell death as a prospective therapy for a wide range of diseases and the Continuation in Part focuses on accelerating cell death as a means of treating cancer. We have filed a second Continuation in Part on the Third Patent Application

On March 25, 2003, we were granted Patent No. 6,538,182, entitled DNA Encoding a Plant Deoxyhypusine Synth

based on data we gathered in studies of ischemic heart tissue and various cell lines. We have also filed a third Continuation in Part on the Third Patent Application based on data which correlates cytokine expression to Factor 5A. We intend to continue our strategy of enhancing these new patent applications through the addition of data as it is collected. We presently have approximately 25 U.S. matters at the PTO, which includes issued patents, CIP s, divisional and provisional applications. In addition, we have numerous international matters in various stages.

We have broadened the scope of our intellectual property protection by utilizing the Patent Cooperation Treaty to facilitate international filing and prosecution of the Patent Applications. The First Patent Application was published through the Patent Cooperation Treaty in August 2000, and then between August 2001 and October 2001, was filed in Australia, Canada, China, Japan, Korea, New Zealand and Europe through the European Patent Office, which has twenty member states. Israel and Mexico are the last remaining countries in which we have opted to file that have yet to issue a filing date. The Patent Cooperation Treaty published the Second Patent Application in January 2001.

Government Regulation

At present, the U.S. federal government regulation of biotechnology is divided among three agencies: (i) the U.S. Department of Agriculture regulates the import, field-testing and interstate movement of specific types of genetic engineering that may be used in the creation of transformed plants; (ii) the Environmental Protection Agency regulates activity related to the invention of plant pesticides and herbicides, which may include certain kinds of transformed plants; and (iii) the Food and Drug Administration regulates foods derived from new plant varieties. The FDA requires that transformed plants meet the same standards for safety that are required for all other plants and foods in general. Except in the case of additives that significantly alter a food s structure, the FDA does not require any additional standards or specific approval for genetically engineered foods but expects transformed plant developers to consult the FDA before introducing a new food into the market place.

In addition, our ongoing pre-clinical research with cell lines and lab animal models of human disease is not currently subject to the FDA requirements that govern clinical trials. However, use of our technology, if developed for human health applications, will also be subject to FDA regulation. Generally, the FDA must approve any drug or biologic product before it can be marketed in the United States. In addition, prior to being sold outside of the U.S., any products resulting from the application of our human health technology must be approved by the regulatory agencies of foreign governments. Prior to filing a new drug application or biologics license application with the FDA, we would have to perform extensive clinical trials, and prior to beginning any clinical trial, we need to perform extensive pre-clinical testing which could take several years and may require substantial expenditures.

We believe that our current activities, which to date have been confined to research and development efforts, do not require licensing or approval by any governmental regulatory agency. However, we, or our licensees, may be required to obtain such licensing or approval from governmental regulatory agencies prior to the commercialization of our genetically transformed plants and mammalian technology.

We have broadened the scope of our intellectual property protection by utilizing the Patent Cooperation Treaty to fa

Employees

In addition to the 24 scientists performing funded research for us at the University of Waterloo, the University of Toronto and the University of Colorado, as of June 30, 2004, we had four employees and one consultant, four of whom are executive officers and are involved in our management. On July 19, 2004, we hired Richard Dondero as our Vice President Research and Development. We do not anticipate hiring any additional employees over the next twelve months.

The officers are assisted by a Scientific Advisory Board that consists of prominent experts in the fields of plant and mammalian cell biology. Alan Bennett, Ph.D., who serves as the Chairman of the Scientific Advisory Board, is the Executive Director of the Office of Technology Transfer at the University of California. His research interests include the molecular biology of tomato fruit development and ripening, the molecular basis of membrane transport, and cell wall disassembly. In addition to his service on the Scientific Advisory Board, we utilize Dr. Bennett as a consultant experienced in plant transformation. Charles A. Dinarello, M.D., who serves as a member of the Scientific Advisory Board, is a Professor of Medicine at the University of Colorado School of Medicine, a member of the U.S. National Academy of Sciences and the author of over 500 published research articles. In addition to his active academic research career, Dr. Dinarello has held advisory positions with two branches of the National Institutes of Health and positions on the Board of Governors of both the Weizmann Institute and Ben Gurion University. Russell L. Jones, Ph.D., who serves as a member of the Scientific Advisory Board, is a professor at the University of California, Berkeley and an expert in plant cell biology and cell death. Dr. Jones is also an editor of Planta, Annual Review of Plant Physiology and Plant Molecular Biology, as well as Research Notes in Plant Science. Additionally, he has held positions on the editorial boards of Plant Physiology and Trends in Plant Science.

Furthermore, pursuant to the Research and Development Agreements, the majority of our research and development activities are conducted at the University of Waterloo under the supervision of Dr. Thompson. We utilize the University s substantial research staff including graduate and post-graduate researchers.

We have also undertaken pre-clinical apoptosis research at the University of Colorado under the supervision of Dr. Dinarello. This research is performed pursuant to specific project proposals that have agreed-upon research outlines, timelines and budgets. We may also contract research to additional university laboratories or to other companies in order to advance the development of our technology.

Safe Harbor Statement

The statements contained in this Annual Report on Form 10-KSB that are not historical facts are forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended, and the Private Securities Litigation Reform Act of 1995. Such forward-looking statements may be identified by, among other things, the use of forward-looking terminology such as believes, expects, may, will, should, or anticipates or the negative thereof or other variations thereon or comparable terminology, or by discussions of strategy that involve risks and uncertainties. In particular, our statements regarding the anticipated growth in the markets for our technologies, the continued advancement of our

research, the approval of our Patent Applications, the possibility of governmental approval in order to sell or offer for sale to the general public a genetically engineered plant or plant product, the successful implementation of our commercialization strategy, including the success of the Harris Moran License, the ArborGen Agreement, the Cal/West License, The Scotts License, the Anawah Agreement and the Research and Development Agreements, the successful implementation of the Rahan Joint Venture, the conversion of the letter of intent with the Tianjin Academy of Agricultural Sciences into an executed agreement, statements relating to our Patent Applications, the anticipated longer term growth of our business, the results of our pre-clinical studies and the timing of the projects and trends in future operating performance are examples of such forward-looking statements. The forward-looking statements include risks and uncertainties, including, but not limited to, the timing of revenues due to the variability in size, scope and duration of research projects, regulatory delays, research study results which lead to cancellations of research projects, and other factors, including general economic conditions and regulatory developments, not within our control. The factors discussed herein and expressed from time to time in our filings with the Securities and Exchange Commission could cause actual results and developments to be materially different from those expressed in or implied by such statements. The forward-looking statements are made only as of the date of this filing, and we undertake no obligation to publicly update such forward-looking statements to reflect subsequent events or circumstances.

Factors That May Affect Our Business, Future Operating Results and Financial Condition.

The more prominent risks and uncertainties inherent in our business are described below. However, additional risks and uncertainties may also impair our business operations. If any of the following risks actually occur, our business, financial condition or results of operations may suffer.

Risks Related to our Business

We have a limited operating history and have incurred substantial losses and expect future losses.

We are a developmental stage biotechnology company with a limited operating history and limited assets and capital. We have incurred losses each year since inception and have an accumulated deficit of $12,574,941 at June 30, 2004. We have generated minimal revenues by licensing certain of our technology to companies willing to share in our development costs. However, our technology may not be ready for widespread commercialization for several years. We expect to continue to incur losses over the next two to three years because we anticipate that our expenditures on research and development, commercialization and administrative activities will significantly exceed our revenues during that period. We cannot predict when, if ever, we will become profitable.

We depend on a single principal technology and, if our technology is not commercially successful, we will have no alternative source of revenue.

Our primary business is the development and commercial exploitation of technology to identify, isolate, characterize and silence genes which control the death of cells in plants and humans. Our future revenue and profitability critically depend upon our ability to successfully

develop senescence and apoptosis gene technology and later market and license such technology at a profit. We have conducted experiments on certain crops with favorable results and have conducted certain preliminary cell-line and animal experiments, which have provided us with data upon which we have designed additional research programs. However, we cannot give any assurance that our technology will be commercially successful or economically viable for all crops or human health applications.

In addition, no assurance can be given that adverse consequences might not result from the use of our technology such as the development of negative effects on plants or humans or reduced benefits in terms of crop yield or protection. Our failure to obtain market acceptance of our technology or to successfully commercialize such technology or develop a commercially viable product would have a material adverse effect on our business.

We outsource all of our research and development activities and, if we are unsuccessful in maintaining our alliances with these third parties, our research and development efforts may be delayed or curtailed.

We rely on third parties to perform all of our research and development activities. Our primary research and development efforts take place at the University of Waterloo in Ontario, Canada, where our technology was discovered, at the University of Colorado, at two research hospitals in Canada, and with our commercial partners. At this time, we do not have the internal capabilities to perform our research and development activities. Accordingly, the failure of third-party research partners, such as the University of Waterloo, to perform under agreements entered into with us, or our failure to renew important research agreements with these third parties, may delay or curtail our research and development efforts.

We have significant future capital needs and may be unable to raise capital when needed, which could force us to delay or reduce our research and development efforts.

As of June 30, 2004, we had cash and highly-liquid investments valued at $4,136,022 and working capital of $3,840,022. Using our available reserves as of June 30, 2004, we believe that we can operate according to our current business plan for at least the next twelve months. To date, we have generated minimal revenues and anticipate that our operating costs will exceed any revenues generated over the next several years. Therefore, we may be required to raise additional capital in the future in order to operate according to our current business plan, and this funding may not be available on favorable terms, if at all. In addition, in connection with any funding, if we need to issue more equity securities than our certificate of incorporation currently authorizes, or more than 20% of the shares of our common stock outstanding, we may need stockholder approval. If stockholder approval is not obtained or if adequate funds are not available, we may be required to curtail operations significantly or to obtain funds through arrangements with collaborative partners or others that may require us to relinquish rights to certain of our technologies, product candidates, products or potential markets. Investors may experience dilution in their investment from future offerings of our common stock. For example, if we raise additional capital by issuing equity securities, such an issuance would reduce the percentage ownership of existing stockholders. In addition, assuming the exercise of all options and warrants outstanding, as of June 30, 2004, we had 9,320,664 shares of common stock authorized but unissued, which may be issued from time to time by our board of directors without stockholder approval. Furthermore, we may need to issue securities that have rights, preferences and privileges senior to our common stock. Failure to obtain financing on

acceptable terms would have a material adverse effect on our liquidity.

Since our inception, we have financed all of our operations through private equity financings. Our future capital requirements depend on numerous factors, including:

the scope of our research and development;

our ability to attract business partners willing to share in our development costs;

our ability to successfully commercialize our technology;

competing technological and market developments;

our ability to enter into collaborative arrangements for the development, regulatory approval and commercialization of other products; and

the cost of filing, prosecuting, defending and enforcing patent claims and other intellectual property rights.

Our business depends upon our patents and proprietary rights and the enforcement of these rights. Our failure to obtain and maintain patent protection may increase competition and reduce demand for our technology.

As a result of the substantial length of time and expense associated with developing products and bringing them to the marketplace in the agricultural and biotechnology industries, obtaining and maintaining patent and trade secret protection for technologies, products and processes is of vital importance. Our success will depend in part on several factors, including, without limitation:

our ability to obtain patent protection for our technologies and processes;

our ability to preserve our trade secrets; and

our ability to operate without infringing the proprietary rights of other parties both in the United States and in foreign countries.

We have been issued two patents by the U.S. Patent and Trademark Office, or PTO. We have also filed patent applications for our technology in the United States and in several foreign countries, which technology is vital to our primary business, as well as several Continuations in Part on these patent applications. Our success depends in part upon the grant of patents from our pending patent applications.

Although we believe that our technology is unique and will not violate or infringe upon the proprietary rights of any third party, we cannot assure you that these claims will not be made or if made, could be successfully defended against. If we do not obtain and maintain patent protection, we may face increased competition in the United States and internationally, which would have a material adverse effect on our business.

Since patent applications in the United States are maintained in secrecy until patents are issued, and since publication of discoveries in the scientific and patent literature tend to lag behind actual discoveries by several months, we cannot be certain that we were the first creator of the inventions covered by our pending patent applications or that we were the first to file patent applications for these inventions.

In addition, among other things, we cannot assure you that:

our patent applications will result in the issuance of patents;

any patents issued or licensed to us will be free from challenge and that if challenged,

would be held to be valid;

any patents issued or licensed to us will provide commercially significant protection for our technology, products and processes;

other companies will not independently develop substantially equivalent proprietary information which is not covered by our patent rights;

other companies will not obtain access to our know-how;

other companies will not be granted patents that may prevent the commercialization of our technology; or

we will not require licensing and the payment of significant fees or royalties to third parties for the use of their intellectual property in order to enable us to conduct our business.

Our competitors may allege that we are infringing upon their intellectual property rights, forcing us to incur substantial costs and expenses in resulting litigation, the outcome of which would be uncertain.

Patent law is still evolving relative to the scope and enforceability of claims in the fields in which we operate. We are like most biotechnology companies in that our patent protection is highly uncertain and involves complex legal and technical questions for which legal principles are not yet firmly established. In addition, if issued, our patents may not contain claims sufficiently broad to protect us against third parties with similar technologies or products, or provide us with any competitive advantage.

The PTO and the courts have not established a consistent policy regarding the breadth of claims allowed in biotechnology patents. The allowance of broader claims may increase the incidence and cost of patent interference proceedings and the risk of infringement litigation. On the other hand, the allowance of narrower claims may limit the value of our proprietary rights.

The laws of some foreign countries do not protect proprietary rights to the same extent as the laws of the United States, and many companies have encountered significant problems and costs in protecting their proprietary rights in these foreign countries.

We could become involved in infringement actions to enforce and/or protect our patents. Regardless of the outcome, patent litigation is expensive and time consuming and would distract our management from other activities. Some of our competitors may be able to sustain the costs of complex patent litigation more effectively that we could because they have substantially greater resources. Uncertainties resulting from the initiation and continuation of any patent litigation could limit our ability to continue our operations.

If our technology infringes the intellectual property of our competitors or other third parties, we may be required to pay license fees or damages.

If any relevant claims of third-party patents that are adverse to us are upheld as valid and enforceable, we could be prevented from commercializing our technology or could be required to obtain licenses from the owners of such patents. We cannot assure you that such licenses would be available or, if available, would be on acceptable terms. Some licenses may be non-exclusive and, therefore, our competitors may have access to the same technology licensed to us. In addition, if any parties successfully claim that the creation or use of our technology infringes upon their intellectual property rights, we may be forced to pay damages, including treble damages.

Our security measures may not adequately protect our unpatented technology and, if we are unable to protect the confidentiality of our proprietary information and know-how, the value of our technology may be adversely affected.

Our success depends upon know-how, unpatentable trade secrets, and the skills, knowledge and experience of our scientific and technical personnel. As a result, we require all employees to agree to a confidentiality provision that prohibits the disclosure of confidential information to anyone outside of our company, during the term of employment and thereafter. We also require all employees to disclose and assign to us the rights to their ideas, developments, discoveries and inventions. We also attempt to enter into similar agreements with our consultants, advisors and research collaborators. We cannot assure you that adequate protection for our trade secrets, know-how or other proprietary information against unauthorized use or disclosure will be available.

We occasionally provide information to research collaborators in academic institutions and request the collaborators to conduct certain tests. We cannot assure you that the academic institutions will not assert intellectual property rights in the results of the tests conducted by the research collaborators, or that the academic institutions will grant licenses under such intellectual property rights to us on acceptable terms, if at all. If the assertion of intellectual property rights by an academic institution is substantiated, and the academic institution does not grant intellectual property rights to us, these events could limit our ability to commercialize our technology.

As we evolve from a company primarily involved in the research and development of our technology into one that is also involved in the commercialization of our technology, we may have difficulty managing our growth and expanding our operations.

As our business grows, we may need to add employees and enhance our management, systems and procedures. We will need to successfully integrate our internal operations with the operations of our marketing partners, manufacturers, distributors and suppliers to produce and market commercially viable products. We may also need to manage additional relationships with various collaborative partners, suppliers and other organizations. Although we do not presently intend to conduct research and development activities in-house, we may undertake those activities in the future. Expanding our business will place a significant burden on our management and operations. We may not be able to implement improvements to our management information and control systems in an efficient and timely manner and we may discover deficiencies in our existing systems and controls. Our failure to effectively respond to changes may make it difficult for us to manage our growth and expand our operations.

We have no marketing or sales history and depend on third-party marketing partners. Any failure of these parties to perform would delay or limit our commercialization efforts.

We have no history of marketing, distributing or selling biotechnology products and we are relying on our ability to successfully establish marketing partners or other arrangements with third parties to market, distribute and sell a commercially viable product both here and abroad. Our business plan also envisions creating strategic alliances to access needed commercialization and marketing expertise. We may not be able to attract qualified sub-licensees, distributors or marketing partners, and even if qualified, these marketing partners may not be able to successfully market agricultural products or human health applications developed with our

technology. If we fail to successfully establish distribution channels, or if our marketing partners fail to provide adequate levels of sales, our commercialization efforts will be delayed or limited and we will not be able to generate revenue.

We will depend on joint ventures and strategic alliances to develop and market our technology and, if these arrangements are not successful, our technology may not be developed and the expenses to commercialize our technology will increase.

In its current state of development, our technology is not ready to be marketed to consumers. We intend to follow a multi-faceted commercialization strategy that involves the licensing of our technology to business partners for the purpose of further technological development, marketing and distribution. We are seeking business partners who will share the burden of our development costs while our technology is still being developed, and who will pay us royalties when they market and distribute products incorporating our technology upon commercialization. The establishment of joint ventures and strategic alliances may create future competitors, especially in certain regions abroad where we do not pursue patent protection. If we fail to establish beneficial business partners and strategic alliances, our growth will suffer and the continued development of our technology may be harmed.

Competition in the agricultural and human health biotechnology industries is intense and technology is changing rapidly. If our competitors market their technology faster than we do, we may not be able to generate revenues from the commercialization of our technology.

Many agricultural and human health biotechnology companies are engaged in research and development activities relating to senescence and apoptosis. The market for plant protection and yield enhancement products is intensely competitive, rapidly changing and undergoing consolidation. We may be unable to compete successfully against our current and future competitors, which may result in price reductions, reduced margins and the inability to achieve market acceptance for products containing our technology. Our competitors in the field of plant senescence gene technology are companies that develop and produce transgenic plants and include major international agricultural companies, specialized biotechnology companies, research and academic institutions and, potentially, our joint venture and strategic alliance partners. These companies include: Paradigm Genetics; Aventis Crop Science; Mendel Biotechnology; Renessen LLC; Exelixis Plant Sciences, Inc.; PlantGenix, Inc.; and Eden Bioscience, among others. Some of our competitors that are involved in apoptosis research include: Amgen; Centocor; Genzyme; OSI Pharmaceuticals, Inc.; Idun Pharmaceuticals; Novartis; Introgen Therapeutics, Inc.; Genta, Inc.; and Vertex Pharmaceuticals, Inc. Many of these competitors have substantially greater financial, marketing, sales, distribution and technical resources than us and have more experience in research and development, clinical trials, regulatory matters, manufacturing and marketing. We anticipate increased competition in the future as new companies enter the market and new technologies become available. Our technology may be rendered obsolete or uneconomical by technological advances or entirely different approaches developed by one or more of our competitors, which will prevent or limit our ability to generate revenues from the commercialization of our technology.

Our business is subject to various government regulations and, if we are unable to obtain regulatory approval, we may not be able to continue our operations.

At present, the U.S. federal government regulation of biotechnology is divided among three agencies:

the USDA regulates the import, field testing and interstate movement of specific types of genetic engineering that may be used in the creation of transgenic plants;

the EPA regulates activity related to the invention of plant pesticides and herbicides, which may include certain kinds of transgenic plants; and

the FDA regulates foods derived from new plant varieties.

The FDA requires that transgenic plants meet the same standards for safety that are required for all other plants and foods in general. Except in the case of additives that significantly alter a food s structure, the FDA does not require any additional standards or specific approval for genetically engineered foods, but expects transgenic plant developers to consult the FDA before introducing a new food into the marketplace.

Use of our technology, if developed for human health applications, will also be subject to FDA regulation. The FDA must approve any drug or biologic product before it can be marketed in the United States. In addition, prior to being sold outside of the U.S., any products resulting from the application of our human health technology must be approved by the regulatory agencies of foreign governments. Prior to filing a new drug application or biologics license application with the FDA, we would have to perform extensive clinical trials, and prior to beginning any clinical trial, we need to perform extensive preclinical testing which could take several years and may require substantial expenditures.

We believe that our current activities, which to date have been confined to research and development efforts, do not require licensing or approval by any governmental regulatory agency. However, federal, state and foreign regulations relating to crop protection products and human health applications developed through biotechnology are subject to public concerns and political circumstances, and, as a result, regulations have changed and may change substantially in the future. Accordingly, we may become subject to governmental regulations or approvals or become subject to licensing requirements in connection with our research and development efforts. We may also be required to obtain such licensing or approval from the governmental regulatory agencies described above, or from state agencies, prior to the commercialization of our genetically transformed plants and human health technology. In addition, our marketing partners who utilize our technology or sell products grown with our technology may be subject to government regulations. If unfavorable governmental regulations are imposed on our technology or if we fail to obtain licenses or approvals in a timely manner, we may not be able to continue our operations.

Pre-clinical studies and clinical trials of our human health applications may be unsuccessful, which could delay or prevent regulatory approval.

Pre-clinical studies may reveal that our human health technology is ineffective or harmful, and/or clinical trials may be unsuccessful in demonstrating efficacy and safety of our human health technology, which would significantly limit the possibility of obtaining regulatory approval for any drug or biologic product manufactured with our technology. The FDA requires

submission of extensive preclinical, clinical and manufacturing data to assess the efficacy and safety of potential products. Furthermore, the success of preliminary studies does not ensure commercial success, and later-stage clinical trials may fail to confirm the results of the preliminary studies.

Even if we receive regulatory approval, consumers may not accept our technology, which will prevent us from being profitable since we have no other source of revenue.

We cannot guarantee that consumers will accept products containing our technology. Recently, there has been consumer concern and consumer advocate activism with respect to genetically engineered consumer products. The adverse consequences from heightened consumer concern in this regard could affect the markets for products developed with our technology and could also result in increased government regulation in response to that concern. If the public or potential customers perceive our technology to be genetic modification or genetic engineering, agricultural products grown with our technology may not gain market acceptance.

We depend on our key personnel and, if we are not able to attract and retain qualified scientific and business personnel, we may not be able to grow our business or develop and commercialize our technology.

We are highly dependent on our scientific advisors, consultants and third-party research partners. Dr. Thompson is the inventor of our technology and the driving force behind our current research. The loss of Dr. Thompson would severely hinder our technological development. Our success will also depend in part on the continued service of our key employees and our ability to identify, hire and retain additional qualified personnel in an intensely competitive market. Although we have employment agreements with several of our key employees and a research agreement with Dr. Thompson, these agreements may be terminated upon no or short notice. We do not maintain key person life insurance on any member of management. The failure to attract and retain key personnel could limit our growth and hinder our research and development efforts.

Certain provisions of our charter, by-laws and Delaware law could make a takeover difficult.

Certain provisions of our certificate of incorporation and by-laws could make it more difficult for a third party to acquire control of us, even if the change in control would be beneficial to stockholders. Our certificate of incorporation authorizes our board of directors to issue, without stockholder approval, except as may be required by the rules of the American Stock Exchange, 5,000,000 shares of preferred stock with voting, conversion and other rights and preferences that could adversely affect the voting power or other rights of the holders of our common stock. Similarly, our by-laws do not restrict our board of directors from issuing preferred stock without stockholder approval.

In addition, we are subject to the Business Combination Act of the Delaware General Corporation Law which, subject to certain exceptions, restricts certain transactions and business combinations between a corporation and a stockholder owning 15% or more of the corporation s outstanding voting stock for a period of three years from the date such stockholder becomes a 15% owner. These provisions may have the effect of delaying or preventing a change of control of us without action by our stockholders and, therefore, could adversely affect the value of our common stock.

19

Furthermore, in the event of our merger or consolidation with or into another corporation, or the sale of all or substantially all of our assets in which the successor corporation does not assume outstanding options or issue equivalent options, our board of directors is required to provide accelerated vesting of outstanding options.

Increasing political and social turmoil, such as terrorist and military actions, increase the difficulty for us and our strategic partners to forecast accurately and plan future business activities.

Recent political and social turmoil, including the terrorist attacks of September 11, 2001, the conflict in Iraq and the current crisis in the Middle East, can be expected to put further pressure on economic conditions in the United States and worldwide. These political, social and economic conditions may make it difficult for us to plan future business activities. Specifically, if the current crisis in Israel continues to escalate, our joint venture with Rahan Meristem Ltd. could be adversely affected.

Risks Related to Our Common Stock

Our management and other affiliates have significant control of our common stock and could significantly influence our actions in a manner that conflicts with our interests and the interests of other stockholders.

As of June 30, 2004, our executive officers, directors and affiliated entities together beneficially own approximately 44.3% of the outstanding shares of our common stock, assuming the exercise of options and warrants which are currently exercisable, held by these stockholders. As a result, these stockholders, acting together, will be able to exercise significant influence over matters requiring approval by our stockholders, including the election of directors, and may not always act in the best interests of other stockholders. Such a concentration of ownership may have the effect of delaying or preventing a change in control of us, including transactions in which our stockholders might otherwise receive a premium for their shares over then current market prices.

Our stockholders may experience substantial dilution as a result of the exercise of outstanding options and warrants to purchase our common stock.

As of June 30, 2004, we have granted options outside of our stock option plan to purchase 10,000 shares of our common stock and outstanding warrants to purchase 5,003,586 shares of our common stock. In addition, as of June 30, 2004, we have reserved 3,000,000 shares of our common stock for issuance upon the exercise of options granted pursuant to our stock option plan, 1,946,000 of which have been granted and 1,054,000 of which may be granted in the future. The exercise of these options and warrants will result in dilution to our existing stockholders and could have a material adverse effect on our stock price.

A significant portion of our total outstanding shares of common stock may be sold in the market in the near future, which could cause the market price of our common stock to drop significantly.

As of June 30, 2004, we had 13,787,250 shares of our common stock issued and outstanding, of which approximately 1,536,922 shares are registered pursuant to a registration statement on Form S-3, which was declared effective on May 14, 2004, and the remainder of

which are either eligible to be sold SEC Rule 144 or are in the public float. In addition, we have registered 1,114,741 shares of our Common Stock underlying warrants previously issued on the Form S-3 registration statement that was declared effective on May 14, 2004, and we registered 3,000,000 shares of our common stock underlying options granted or to be granted under our stock option plan. Consequently, sales of substantial amounts of our common stock in the public market, or the perception that such sales could occur, may have a material adverse effect on our stock price.

Our common stock has a limited trading market, which could limit your ability to resell your shares of common stock at or above your purchase price.

Our common stock is quoted on the American Stock Exchange and currently has a limited trading market. We cannot assure you that an active trading market will develop or, if developed, will be maintained. As a result, our stockholders may find it difficult to dispose of shares of our common stock and, as a result, may suffer a loss of all or a substantial portion of their investment.

The market price of our common stock may fluctuate after this offering and may drop below the price you paid.

We cannot assure you that you will be able to resell the shares of our common stock at or above your purchase price. The market price of our common stock may fluctuate significantly in response to a number of factors, some of which are beyond our control. These factors include:

quarterly variations in operating results;

the progress or perceived progress of our research and development efforts;

changes in accounting treatments or principles;

announcements by us or our competitors of new technology, product and service offerings, significant contracts, acquisitions or strategic relationships;

additions or departures of key personnel;

future offerings or resales of our common stock or other securities;

stock market price and volume fluctuations of publicly-traded companies in general and development companies in particular; and

general political, economic and market conditions.

Because we do not intend to pay, and have not paid, any cash dividends on our shares of common stock, our stockholders will not be able to receive a return on their shares unless the value of our common stock appreciates and they sell their shares.

We have never paid or declared any cash dividends on our common stock and we intend to retain any future earnings to finance the development and expansion of our business. We do not anticipate paying any cash dividends on our common stock in the foreseeable future. Therefore, our stockholders will not be able to receive a return on their investment unless the value of our common stock appreciates and they sell their shares.

If our common stock is delisted from the American Stock Exchange, it may be subject to the penny stock regulations which may affect the ability of our stockholders to sell their shares.

In general, regulations of the SEC define a penny stock to be an equity security that is not listed on a national securities exchange or the NASDAQ Stock Market and that has a market

price of less than $5.00 per share or with an exercise price of less than $5.00 per share, subject to certain exceptions. If the American Stock Exchange delists our common stock, it could be deemed a penny stock, which imposes additional sales practice requirements on broker-dealers that sell such securities to persons other than certain qualified investors. For transactions involving a penny stock, unless exempt, a broker-dealer must make a special suitability determination for the purchaser and receive the purchaser s written consent to the transaction prior to the sale. In addition, the rules on penny stocks require delivery, prior to and after any penny stock transaction, of disclosures required by the SEC.

If our common stock were subject to the rules on penny stocks, the market liquidity for our common stock could be severely and adversely affected. Accordingly, the ability of holders of our common stock to sell their shares in the secondary market may also be adversely affected.

Item 2. **Properties.**

We lease office space in New Brunswick, New Jersey for a monthly rental fee of $2,838, subject to certain escalations for our proportionate share of increases, over the base year of 2001, in the building s operating costs. The lease expires in May 2006. We have an option to renew the lease for an additional five-year period through May 2011. The space is in good condition, and we believe it will adequately serve as our headquarters over the term of the lease. We also believe that this office space is adequately insured by the lessor.

Item 3. **Legal Proceedings.**

We are not currently a party to any legal proceedings; however, we may become involved in various claims and legal actions arising in the ordinary course of business.

Item 4. **Submission of Matters to a Vote of Security Holders.**

None.

PART II

Item 5. **Market for Our Common Equity and Related Stockholder Matters.**

Our common stock trades on the American Stock Exchange under the symbol SNT.

The following table sets forth the range of the high and low sales price for our common stock for each of the quarters since the quarter ended September 30, 2002, as reported on the American Stock Exchange.

Quarter Ended	Common Stock High	Common Stock Low
September 30, 2002	$ 2.35	$ 1.20
December 31, 2002	$ 2.75	$ 1.60
March 31, 2003	$ 2.50	$ 1.95
June 30, 2003	$ 2.50	$ 1.50
September 30, 2003	$ 3.99	$ 2.05
December 31, 2003	$ 3.83	$ 2.75
March 31, 2004	$ 3.50	$ 2.46
June 30, 2004	$ 4.50	$ 2.60

As of September 20, 2004, the approximate number of holders of record of our common stock was 282**.**

We have neither paid nor declared dividends on our common stock since our inception and we do not plan to pay dividends on our common stock in the foreseeable future. We expect that any earnings, which we may realize, will be retained to finance the growth of our company.

Item 6. **Management s Discussion and Analysis or Plan of Operation.**

Overview

We do not expect to generate significant revenues for approximately the next two to three years, during which time we will engage in significant research and development efforts. However, we have entered into the Harris Moran License, the ArborGen Agreement, the Cal/West License and the Scotts License to develop and commercialize our technology in certain varieties of lettuce, melons, trees, alfalfa, bedding plants and turf grass. The Harris Moran License, the Cal/West License, and the Scotts License also provide for royalty payments to us upon commercial introduction. The ArborGen Agreement contains an option for ArborGen to execute a license to commercialize developed products, and upon the execution of a license agreement, we will receive a license fee and royalties from ArborGen. The Cal/West License contains an option for Cal/West to develop our technology in various other forage crops. We also have entered into the Rahan Joint Venture to develop and commercialize our technology in banana plants. In connection with the Rahan Joint Venture, we will receive 50% of the profits from the sale of enhanced banana plants.

Consistent with our commercialization strategy, we intend to attract other companies interested in strategic partnerships or licensing our technology that may result in additional license fees, revenues from contract research and other related revenues. Successful future operations will depend on our ability to transform our research and development activities into commercializable technology.

We plan to employ the same partnering strategy in both the human health and agricultural target markets. Our preclinical research has yielded data that we have presented to various biopharmaceutical companies that may be prospective licensees for the development and marketing of potential applications of our technology.

Critical Accounting Policies and Estimates

Revenue Recognition

We record revenue under technology license and development agreements related to the following. Actual fees received may vary from the recorded estimated revenues.

Nonrefundable upfront license fees that are received in exchange for the transfer of our technology to licensees, for which no further obligations to the licensee exist with respect to the basic technology transferred, are recognized as revenue on the earlier of when payments are received or collections are assured.

Nonrefundable upfront license fees that are received in connection with agreements that include time-based payments are, together with the time-based payments, deferred and amortized ratably over the estimated research period of the license.

Milestone payments, which are contingent upon the achievement of certain research goals, are recognized as revenue when the milestones, as defined in the particular agreement, are achieved.

The effect of any change in revenues from technology license and development

agreements would be reflected in revenues in the period such determination was made. Historically, no such adjustments have been made.

Estimates of Expenses

Our research and development agreements with third parties provide for an estimate of our expenses and costs, which are variable and are based on the actual services performed by the third party. We estimate the aggregate amount of the expenses based upon the projected amounts that are set forth in the agreements, and we accrue the expenses for which we have not yet been invoiced. In estimating the expenses, we consider, among other things, the following factors:

the existence of any prior relationship between us and the third party provider;

the past results of prior research and development services performed by the third party provider; and

the scope and timing of the research and development services set forth in the agreement with the third party provider.

After the research services are performed and we are invoiced, we make any adjustments that are necessary to accurately report research and development expense for the period.

We were amortizing the cost of an initial $200,000 non-refundable payment made under a research agreement over the estimated eighteen-month term of the project, beginning on October 1, 2002. As of June 30, 2004, all the $200,000 non-refundable payment has been amortized.

Valuation Allowances and Carrying Values

We have recorded valuation allowances against our entire deferred tax assets of $3,630,000 at June 30, 2004. The valuation allowances relate primarily to the net operating loss carryforward deferred tax asset where the tax benefit of such asset is not assured.

As of June 30, 2004, we have determined that the estimated future undiscounted cash flows related to our patent applications will be sufficient to recover their carrying value.

We do not have any off-balance sheet arrangements.

Research Program

We do not expect to generate significant revenues for approximately the next two to three years, during which time we will engage in significant research and development efforts. We expect to spend significant amounts on the research and development of our technology. We also expect our research and development costs to increase as we continue to develop and ultimately commercialize our technology. However, the successful development and commercialization of our technology is highly uncertain. We cannot reasonably estimate or know the nature, timing and expenses of the efforts necessary to complete the development of our technology, or the period in which material net cash inflows may commence from the commercialization of our technology, including the uncertainty of:

- the scope, rate of progress and expense of our research activities;

the interim results of our research;

the expense of additional research that may be required after review of the interim results;

the terms and timing of any collaborative, licensing and other arrangements that we may establish;

the expense and timing of regulatory approvals;

the effect of competing technological and market developments; and

the expense of filing, prosecuting, defending and enforcing any patent claims or other intellectual property rights.

Liquidity and Capital Resources

Overview

As of June 30, 2004, our cash balance and investments totaled $4,136,022, and we had working capital of $3,840,022. As of June 30, 2004, we had a federal tax loss carryforward of approximately $9,554,000 and a state tax loss carry-forward of approximately $4,234,000 to offset future taxable income. We cannot assure you that we will be able to take advantage of any or all of such tax loss carryforwards, if at all, in future fiscal years.

Contractual Obligations

The following table lists our cash contractual obligations as of June 30, 2004:

		Payments Due by Period	
Contractual Obligations	**Total**	**1 - 3 years**	**4 - 5 years**

			Less than 1 year			More than 5 years
Research and Development Agreements (1)(5)	$ 1,272,798	$ 607,798	$ 665,000	$	$	
Facility, Rent and Operating Leases (2)	$ 62,436	$ 34,056	$ 28,380	$	$	
Employment, Consulting and Scientific Advisory Board Agreements (3) (4)	$ 1,133,729	$ 604,146	$ 525,000	$ 4,583	$	
Total Contractual Cash Obligations	$ 2,468,963	$ 1,246,000	$ 1,218,380	$ 4,583	$	

(1) Certain of our research and development agreements disclosed herein provide that payment is to be made in Canadian dollars and, therefore, the contractual obligations are subject to fluctuations in the exchange rate.

(2) The lease for our office space in New Brunswick, New Jersey is subject to certain escalations for our proportionate share of increases in the building s operating costs.

(3) Certain of our employment and consulting agreements provide for automatic renewal, which is not reflected in the table, unless terminated earlier by the parties to the respective agreements.

(4) Includes $330,000 for an employment agreement that was not effective until July 19, 2004.

(5) Includes $1,140,000 for a research agreement extension that was not effective until September 1, 2004.

We expect our capital requirements to increase significantly over the next several years as we commence new research and development efforts, increase our business and administrative infrastructure and embark on developing in-house business capabilities and facilities. Our future liquidity and capital funding requirements will depend on numerous factors, including, but not limited to, the levels and costs of our research and development initiatives and the cost and timing of the expansion of our business development and administrative staff.

In March 2004, our research agreement with the University of Waterloo was amended retroactively to September 1, 2002, to increase the research budget from Can $1,092,800 to Can $1,331,133, or approximately from U.S. $720,000 to U.S. $880,000. Effective September 1, 2004, we extended the research and development agreement for an additional two-year period through August 31, 2006, in the amount of Can $1,529,430 or approximately U.S. $1,140,000. Research and development expenses under this agreement for the years ended June 30, 2004 and 2003 aggregated U.S. $560,308 and U.S. $373,240 respectively, and U.S. $2,006,512 for the cumulative period through June 30, 2004.

Capital Resources

Since inception, we have generated revenues of $226,667 in connection with the initial fees received under the Harris Moran License, the ArborGen Agreement, the Cal/West License and the Scotts License. We have not been profitable since inception, we will continue to incur additional operating losses in the future, and we will require additional financing to continue the development and subsequent commercialization of our technology. While we do not expect to generate significant revenues from the licensing of our technology in the near future, we may enter into additional licensing or other agreements with marketing and distribution partners that may result in additional license fees, receive revenues from contract research, or other related revenue.

In December 2003, pursuant to the New Jersey Technology Tax Credit Transfer Program, the Company sold its entire New Jersey net operating loss tax benefit for the fiscal year ended June 30, 2002 in the amount of $105,720 and received net proceeds of $91,448.

In February 2004, we completed a private placement to certain accredited investors for an aggregate amount of 1,536,922 shares of common stock and warrants to purchase 768,459 shares of common stock for the aggregate cash consideration of $3,642,500. The private placement offered units of one share of common stock and a five-year warrant to purchase 0.50

shares of common stock at a price equal to $2.37 per unit. The warrant was offered with an exercise price equal to $3.79 per share, with such warrant vesting on the date of grant. The estimated costs associated with the private placement totaled $379,624.

We anticipate that, based upon our current cash and investments, we will be able to fund our operations for at least the next twelve months. Over the next twelve months, we plan to fund our research and development and commercialization activities by utilizing our current cash balance and investments, achieving some of the milestones set forth in our current licensing agreements and through the execution of additional licensing agreements for our technology.

Market Risk

Foreign Currency Risk

Except for our Research and Development Agreements with the University of Waterloo, which is payable in Canadian dollars, we have no other agreements or transactions denominated in foreign currency. Thus, we do not believe that any fluctuations in foreign currency exchange rates would have a material impact on our financial condition or results of operations.

Interest Rate Risk

We have approximately $4 million in cash and investments as of June 30, 2004. Our cash is invested in short-term investments, which we plan to hold until maturity. We do not believe that any fluctuations in interest rates would have a material impact on our financial condition or results of operations.

Results of Operations

Fiscal Years ended June 30, 2004 and June 30, 2003

The net loss for the years ended June 30, 2004 and June 30, 2003 was $3,078,282 and $2,066,338, respectively, an increase of $1,011,944, or 49.0%. This increase was primarily the result on an increase in stock-based compensation (i.e. noncash) and research and development expenses, which was partially offset by a decrease in other general and administrative expenses.

Revenue for the year ended June 30, 2004 was $16,667, which represented the amortized portion of the initial fee on a development and license agreement. Revenue for the year ended June 30, 2003 was $10,000, which represented the initial fee in connection with a license agreement.

Operating expenses for the years ended June 30, 2004 and June 30, 2003 were $3,405,302 and $2,278,606, respectively, an increase of $1,126,696, or 49.5%. This increase in operating expenses was primarily the result of an increase in stock-based compensation and research and development expenses, which was partially offset by a decrease in other general and administrative expenses. We expect operating expenses to decrease over the next twelve months as we anticipate that stock-based compensation will significantly decrease. We expect that the decrease in stock-based compensation will be partially offset by an increase in research and development expenses as we continue to expand our research and development activities.

General and administrative expenses for the years ended June 30, 2004 and June 30, 2003 were $2,333,432 and $1,469,823, respectively, an increase of $863,609, or 58.8%.

	Year ended June 30,	
	2004	**2003**
Stock-based compensation	$ 1,083,921	$ 122,297
Other general and administrative expenses	1,249,511	1,347,526
Total general and administrative expenses	$ 2,333,432	$ 1,469,823

The increase in stock-based compensation was primarily the result of a warrant being granted in connection with a financial advisory agreement during the year ended June 30, 2004.

The decrease in other general and administrative expenses was primarily due to a decrease in investor relation expenses and professional fees, which was partially offset by an increase in payroll and benefits and corporate insurance.

Investor relations expenses were higher during the year ended June 30, 2003, primarily as a result of the listing fees in connection with listing additional shares of our common stock underlying stock options on the American Stock Exchange.

Professional fees decreased primarily as a result of a decrease in legal fees. During the year ended June 30, 2003, we had incurred additional professional fees related to our filing of registration statements with the Securities and Exchange Commission of Forms S-3 and S-8. Additionally, professional fees decreased during the year ended June 30, 2004 as a result of a decrease in professional fees

associated with the preparation and filing of our Form 10-KSB, Forms 10-QSB and proxy statement.

Payroll and benefits increased primarily as a result of salary increases.

Insurance costs increased primarily because we increased the policy limit on our directors and officers liability insurance policy.

We expect general and administrative expenses to decrease over the next twelve months as we anticipate that stock-based compensation will significantly decrease. We expect that the decrease in stock-based compensation may be partially offset by a modest increase in other general and administrative expenses.

Research and development expenses for the years ended June 30, 2004 and June 30, 2003 were $1,071,870 and $808,783, respectively, an increase of $263,087, or 32.5%. This increase was primarily the result of an increase in stock-based compensation, which was due to options and warrants being issued or becoming exercisable during the year ended June 30, 2004, as well as an increase in the research and development costs incurred in connection with the expanded research undertaken by the University of Waterloo and other institutions as well as the expansion of our human health research programs.

	Year ended June 30,	
	2004	**2003**
Stock-based compensation	$ 93,924	$ 14,880
Other research and development expenses	977,946	793,903
Total research and development expenses	$ 1,071,870	$ 808,783

The breakdown of our research and development expenses between our agricultural and human health research programs are as follows:

	Year ended June 30,	
	2004	**2003**
Agricultural research programs	$ 614,312	$ 427,097
Human health research programs	457,558	381,686
Total research and development expenses	$ 1,071,870	$ 808,783

From Inception on July 1, 1998 through June 30, 2004

From inception of operations on July 1, 1998 through June 30, 2004, we had revenues of $226,667, which consisted of the initial license fees in connection with our various development and license agreements. We do not expect to generate significant revenues for approximately the next two to three years, during which time we will engage in significant research and development efforts.

We have incurred losses each year since inception and have an accumulated deficit of $12,574,941 at June 30, 2004. We expect to continue to incur losses as a result of expenditures on research, product development and administrative activities.

Item 7. Financial Statements.

The financial statements required to be filed pursuant to this Item 7 are included in this Annual Report on Form 10-KSB. A list of the financial statements filed herewith is found at Item 13. Exhibits, List and Reports on Form 8-K.

Item 8. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure.

None.

Item 8A. Controls and Procedures.

Our management, with the participation of our chief executive officer and chief financial officer, evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) as of June 30, 2004. Based on this evaluation, our chief executive officer and chief financial officer concluded that as of June 30, 2004, our disclosure controls and procedures were (1) designed to ensure that material information relating to us, including our consolidated subsidiaries, is made known to our chief executive officer and chief financial officer by others within those entities, particularly during the period in which this report was being prepared and (2) effective, in that they provide reasonable assurance that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC s rules and forms.

No change in our internal controls over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) occurred during the fiscal year ended June 30, 2004 that has materially affected, or is reasonably likely to materially affect, our internal controls over financial reporting.

PART III

Item 9. **Directors and Executive Officers.**

The information relating to our directors, nominees for election as directors and executive officers under the headings Election of Directors and Executive Officers in our definitive proxy statement for the 2004 Annual Meeting of Stockholders is incorporated herein by reference to such proxy statement.

Item 10. **Executive Compensation.**

The discussion under the heading Executive Compensation in our definitive proxy statement for the 2004 Annual Meeting of Stockholders is incorporated herein by reference to such proxy statement.

Item 11. **Security Ownership of Certain Beneficial Owners and Management.**

The discussion under the heading Security Ownership of Certain Beneficial Owners and Management in our definitive proxy statement for the 2004 Annual Meeting of Stockholders is incorporated herein by reference to such proxy statement.

Item 12. **Certain Relationships and Related Transactions.**

The discussion under the heading Certain Relationships and Related Transactions in our definitive proxy statement for the 2004 Annual Meeting of Stockholders is incorporated herein by reference to such proxy statement.

Item 13. **Exhibits, List and Reports on Form 8-K.**

(a) (1) Financial Statements.

Reference is made to the Index to Financial Statements on Page F-1.

(a) (2) Financial Statement Schedules.

None.

(a) (3) Exhibits.

Reference is made to the Exhibit Index on Page 35.

(b) Reports on Form 8-K.

None.

Item 14. **Principal Accountant Fees and Services.**

The discussion under the heading Principal Accountant Fees and Services in our definitive proxy statement for the 2004 Annual Meeting of Stockholders is incorporated herein by reference to such proxy statement.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized this 28th day of September 2004.

SENESCO TECHNOLOGIES, INC.

By: /s/ Bruce C. Galton
Bruce C. Galton, President and
Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Ruedi Stalder Ruedi Stalder	Chairman and Director	September 28, 2004
/s/ Bruce C. Galton Bruce C. Galton	President and Chief Executive Officer (principal executive officer) and Director	September 28, 2004
/s/ Joel Brooks		