



Annual Report 2008

“To finally spark the creation of a clean energy economy, we will make the investments in the next three years to double our Nation’s renewable energy capacity.”

—*President Barack Obama, from “A New Era of Responsibility: Renewing America’s Promise*



Vision

During the next 20 years, with an expanding global population, improved diets and rapidly growing energy demands, society will need to develop plants enhanced for food, feed, fiber and fuel production in order to limit the demand for increased production acreage. With the growth of energy generation from agricultural feedstocks, agricultural and energy supply chains serving the needs of a growing carbohydrate economy are expected to become integrated. Agricultural systems have had a major impact on the global environment; Mendel's technologies will contribute substantially to minimizing environmental consequences of agriculture for future generations.

Mission

To create value from our knowledge about the regulation of plant gene and pathway function – knowledge that enables advanced improvement in plant variety performance, and the delivery of associated services, to meet global agricultural and energy production needs.

We will capture value by:

- Distributing genetics for major row crops through differentiated customer seed products; and,
- Distributing genetics for biomass crops serving the BioEnergy industry through differentiated Mendel plant and seed products.

Core Corporate Values:

Sustainability – of our planet, of our business

Restless innovation – change is constant; so is our drive to innovate

Scientific excellence – world-class science solving global problems

Effective collaboration – dynamic teamwork is critical to success

Dear Shareholder:

In 2008 we began deploying the capital raised in 2007 to grow value in both our Trait Technology business segment and our BioEnergy Seeds business segment. The organizational growth initiated in 2007 continued throughout 2008, with the company closing the year with over 100 employees, having started 2007 with fewer than 60 employees. Our growth continued despite the recognition that we find ourselves in the midst of a serious recession. However, we have developed a range of plans to address the very different future financial environments we might face and are proceeding with care.

Two major events were centerpieces of our value growth in 2008: a) the advancement into Phase III development by Monsanto of a soybean yield product, the basis of which is a Mendel technology; and b) the establishment of the first-ever field trials of genetically diverse Miscanthus varieties for biomass production in the United States.

In this annual report, you will find an overview of:

- The forces that are shaping our business direction and current market challenges (e.g., prices, policies)
- Our core technology and traits platform
- Our approach to sustaining our technology leadership
- How we are building our Mendel BioEnergy Seeds segment
 - Two pronged approach:
 - a) Creating the world's best varieties and best engine for variety creation of leading energy grasses;
 - b) positioning for commercial releases and sales as the market grows
 - Addressing the nearer-term power market in addition to the biofuels market
- The strategic collaborators critical to our success
- Major events of 2008
- Prospects for 2009

The scale, duration, cost and complexity
of energy matters pose great challenges.

—*Steven Koonin,*
Department of Energy,
Under Secretary of Science



“The best way to predict the future
is to invent it.”

—Alan Kay,

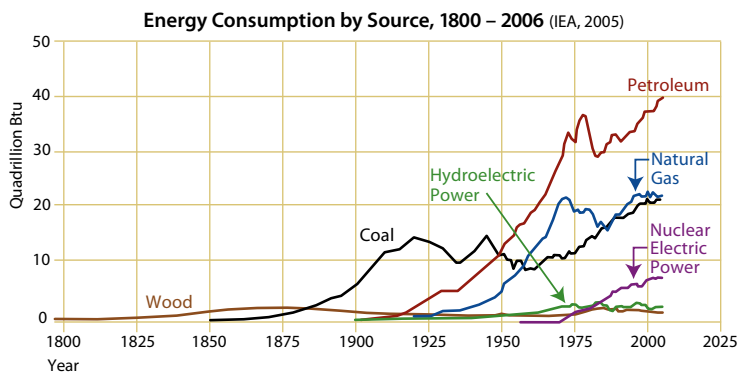
Former Xerox Researcher



The Forces Shaping Our Business

“Change and sustainability” were the guiding themes in my 2007 report. These remain the major themes for Mendel in 2008 – change greater than any of us could have imagined a year ago in the global economic environment; sustainability of the enterprise as a focus for our planning, and sustainable biomass systems as an ever more important goal for our seeds business. While the global ranks of the unemployed grew dramatically in the second half of the past year, Mendel continued to add key staff to support our growth vision, though we did so with caution and a commitment to making only critical strategic hires. Our business strategy is driven by major long-term, durable changes in the global agriculture and energy economy; the challenge is to manage through short-term shocks to the economy, threats to acceptance of biofuels, and a changing policy environment.

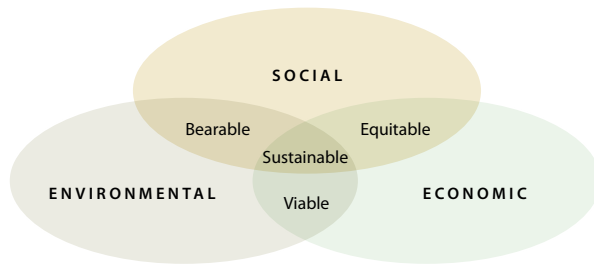
The major energy feedstocks, and the feedstocks for the materials we rely on as a society, have dramatically influenced the shape of our economy. Our dominant energy and material feedstocks have changed several times over the past two centuries. The shifts have been driven by technology and economics, more than availability of resources. It’s been said that the stone age didn’t end for lack of stones, but for a shift to materials with higher value on some criterion. Today, a shift in our energy economy is starting based on the need to enhance energy security and reduce GHG emissions. Through the bulk of the 19th century, carbohydrates – in the form of wood and other plant materials – were dominant. In the 20th century, various fossil fuels, first primarily coal and now a mixture of petroleum and coal, dominated. The dominance of fossil fuels continues as we enter the 21st century, and will continue throughout much of the century, but we project renewable energy to be a major contributor before the century is over.



One long-term need is production of food, feed, fiber and fuel in a sustainable manner through agriculture. Sustainability is one of the core values underlying our vision and our business, and motivating our employees. Amongst the many definitions of sustainability proffered in recent years, we have embraced the following one:

“Adopting practices and developing products that are environmentally, socially and economically sound, and that can meet present needs without compromising the ability of future generations to meet their needs.”

The three pillars of sustainability and sustainable development, and their interactions, are represented in a figure below.



Despite recent economic shocks and an uncertain recovery, our forecast of the fundamental shift to a larger proportion of renewable energy over the next 20-30 years, which underpins our current business model, remains unchanged. The demand for renewable energy produced from biomass – both liquid transportation fuels and electricity – is projected to grow dramatically over the next 20 years or more. In fact, our belief in the increased demand for reliable sources of biomass – from dedicated energy crops – is even stronger than it was last year, since we forecast renewable power to create a growing demand for feedstocks.

We are developing and integrating a suite of emerging techniques that will enhance our ability to engineer pathway structure and function for improved plant products.

Two other critical forces emerged in 2008 with the potential to influence the development of our BioEnergy Seeds business segment. First was the growing unease in some quarters about the agricultural footprint from bioenergy feedstock production as it impacts land use patterns (i.e., indirect land use change (ILUC) and decisions determining future land use. Mendel agrees that there is potential for secondary land conversions driven by primary conversion of lands to bioenergy purposes; however, by deploying “the right crops on the right lands”, such as lands that are not sufficiently productive for food purposes, the ILUC issue is substantially mitigated. Second was the emergence of an increasingly supportive policy environment for advanced, low carbon biofuels and bioenergy systems, with the potential for even further support through new legislation in 2009 and 2010. We view this policy environment as a strong market signal motivating continued development of our BioEnergy Seeds segment.

While potential adverse secondary impacts on the global ecosystem and on reduced food availability from continued expansion of biofuel production – particularly the continued production of corn starch-derived ethanol – the dramatic improvements afforded by plant genomics and biotechnology will enable us to have adequate food, feed, fiber and fuel derived from agriculture. Through our collaboration with Monsanto, we are working to improve the sustainable production of corn. Further, we envision the growth of a large, 2nd generation biofuels industry that provides significant economic growth while improving management of our global lands. Peter Kareiva of the Nature Conservancy points out that we have only domesticated species and domesticated landscapes. One of our goals is to ensure that the domesticated systems our products serve are managed to sustain critical ecosystem services, such as overall biodiversity, water quality, soil fertility and soil carbon content.

Core Technology and Traits Platform

Mendel has worked since its inception on the development and patenting of “traits” for improved plant performance, based on genomics and biotechnology tools and insights. We have done this using *Arabidopsis thaliana* as a model organism, taking advantage of the extensive international academic effort (over 12,000 scientists) to understand the function of all the genes and pathways

“Low carbon growth is going to be
the only growth story of the future.”

—*Lord Nicholas Stern,*
Former President,
World Bank

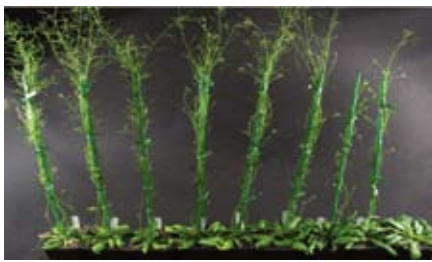
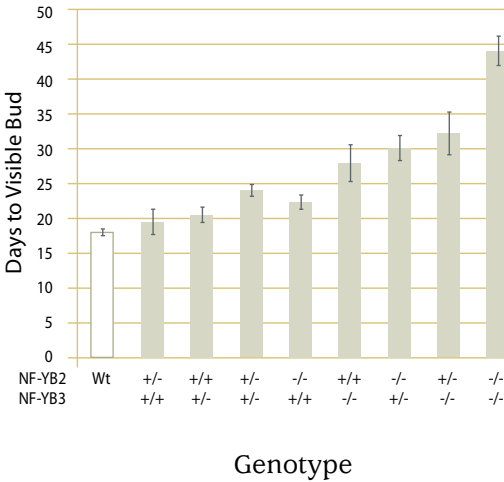


“Our previous investments in science led to the birth of the semiconductor, computer, and bio-technology industries that have added greatly to our economic prosperity. Now, we need similar breakthroughs on energy.”

—*Steven Chu, Secretary of Energy,
March 2009*



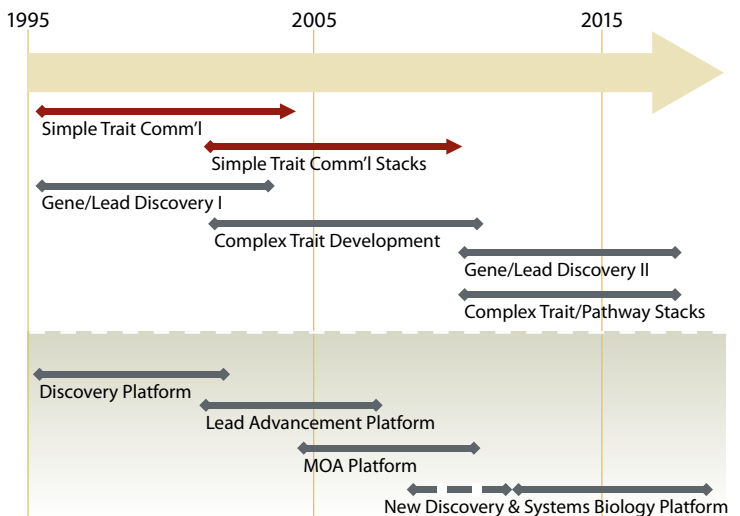
of Arabidopsis. We have focused on a large class of genes called transcription factors because each transcription factor can regulate and coordinate the expression of a set of effector genes that together determine specific plant traits.



Flowering time became increasingly delayed as copies of the NF-YB2 and NF-YB3 genes are inactivated by mutation.

We have identified transcription factors which control traits that are increasingly critical to sustainable agricultural production: efficient use of water and nitrogen, increased inherent crop yield per acre, efficient use of light energy, and reduced losses due to environmental stresses such as drought, heat, cold and disease. We have made many inventions in which altered expression of a transcription factor can be used to confer these desired traits. We have been increasingly successful in securing patents on these inventions, with a growing number of issued patents and pending patent filings in the U.S. and around the world. We also maintain a leading position scientifically through publication of some of our key results. One example is shown (left) in work to define key regulators of a flowering pathway from the NF-Y transcription factor family. Mendel scientists demonstrated a novel role for members of the NF-Y-B family, and the similarity of function of two of these family members, based on dramatic delay in flowering through mutation of both the NF-YB2 and NF-YB3 genes.

The markets for the major agricultural commodities corn and soybean, which are critically important to value growth for Mendel's technologies commercialized in Monsanto's seed products, were on a roller-coaster ride in 2008. Plantings were delayed due to unusually late rains, and due to other shocks to the production system (such as drought in Australia), the price of these commodities soared mid-year, returning to more modest levels toward year-end. Overall yields were good, as was overall production in the major markets, so the major market we serve was very strong overall. Given the increased pricing for corn and soybeans in 2008, companies such as Monsanto providing agricultural inputs had good years financially.



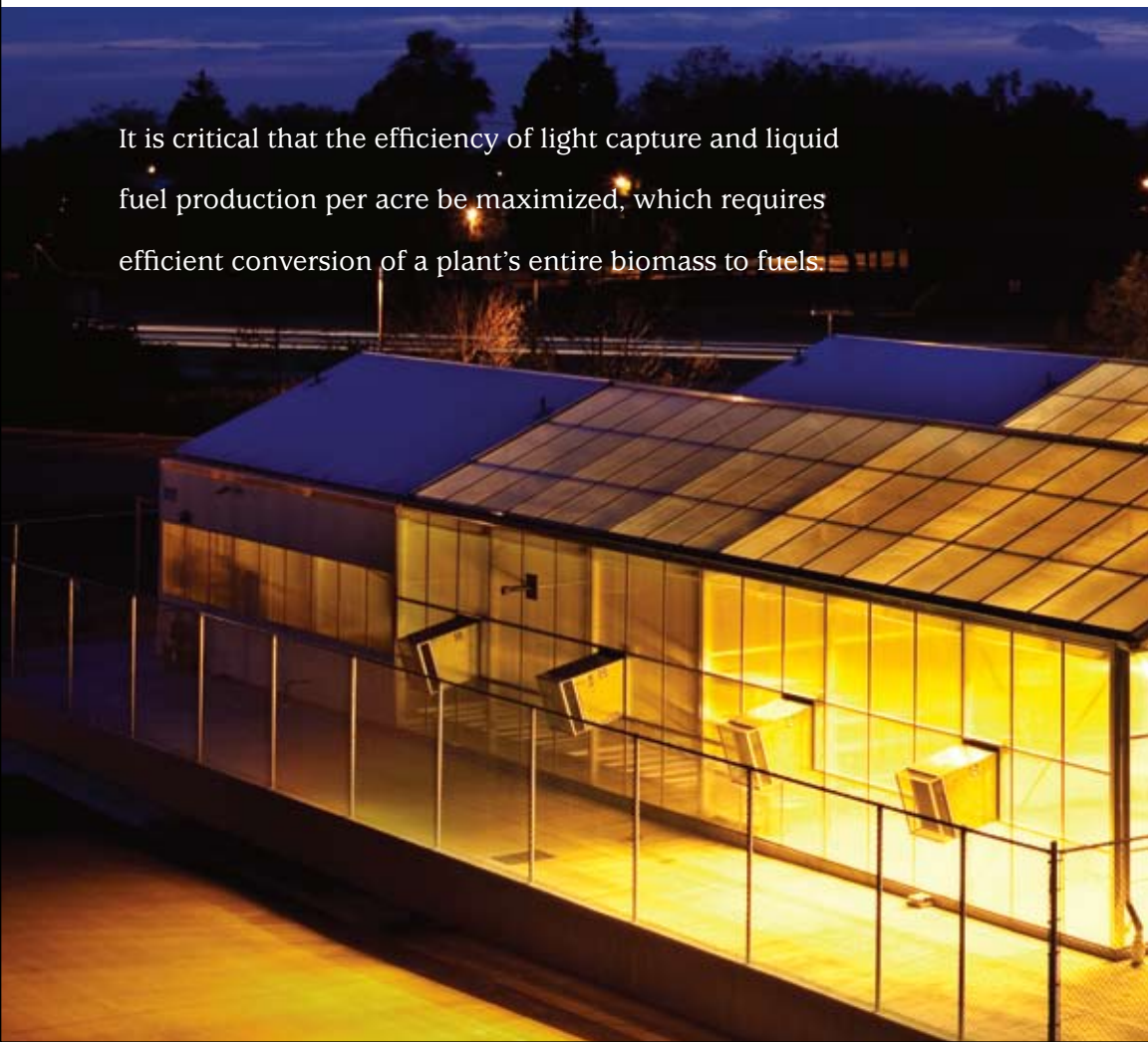
We are building an outstanding leadership team to take Mendel to the next level as a technology and seeds company.

The entire agricultural biotechnology industry is now focused on developing new products based on the first phase of genomics-based biological insights. Mendel has emerged as a leader in providing trait technologies to seed companies. Our transcription factor, regulatory gene strategy was further validated late in 2008 through the advancement of a Monsanto product relying on a Mendel technology to their Phase III development stage, which is consistent with the strong yield improvement delivered by our technology over several years. Another point of validation was the progress made by ArborGen deploying Mendel's freezing tolerance technology to create eucalyptus varieties that are tolerant to the periodic freezes that occur in the Southeastern United States. ArborGen submitted a regulatory dossier in December of last year for approval of a freezing-tolerant Eucalyptus variety. The submission of a regulatory dossier represents a major step towards final commercialization.

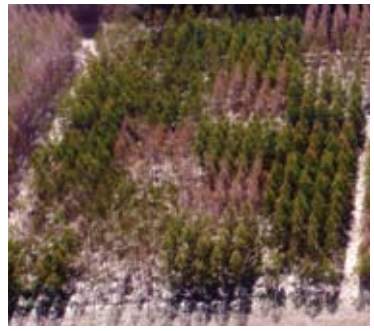


Dayton, Iowa — 2008: Higher-yielding soybean advanced to Phase 3 with continued demonstration of improved yield over conventional controls. (Photo Courtesy of Monsanto Company)

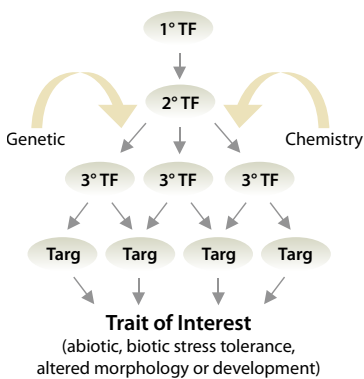
It is critical that the efficiency of light capture and liquid fuel production per acre be maximized, which requires efficient conversion of a plant's entire biomass to fuels.



This aerial shot of a field trial shows Eucalyptus in a block trial against the ArborGen Freeze-Tolerant Eucalyptus within a few weeks of experiencing a low temperature of 19.7 F. The blocks of green trees demonstrate the effectiveness of this new technology in achieving the goal of a higher level of freeze-tolerance than occurs in a plant's usual range. (Photo Courtesy of ArborGen, LLC)




Finally, we are collaborating with Bayer CropSciences on the discovery of **chemicals that can be applied to crops to enhance their tolerance to a range of stresses**. The rationale is summarized in the figure below, which indicates that we can either use genetics or chemistry to regulate traits of high value to farmers. This chemical discovery program is based on high throughput, chemical screening of synthetic chemical libraries,



using our pathway knowledge, which allows us to find chemicals that regulate complex plant traits. Rather than having to measure drought tolerance or disease resistance of large numbers of plants in soil, which is very challenging and costly, we measure indirectly the function of a pathway known to control such traits. We have already been successful using Arabidopsis to identify chemistries that have been applied to crop plants to confer stress tolerance. We expect to deploy this technology to develop novel agricultural chemistries that regulate additional plant traits.



A photograph of a greenhouse interior. In the foreground, several tall, slender green plants, possibly corn or sorghum, are in focus. The background shows a complex metal structure of the greenhouse, with several warm, glowing lights illuminating the scene. The overall atmosphere is one of growth and technology.

“Congress is forging a new,
clean-energy future for our
nation that will create jobs
and jumpstart our economy.”

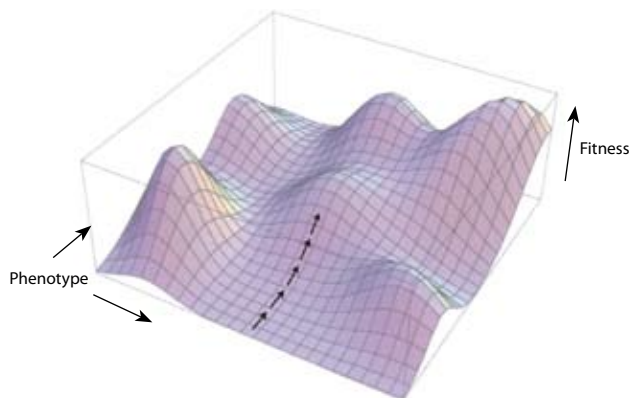
—*Franz Matzner,*
National Resources
Defense Council,
April 2009

Sustaining Our Technology Leadership

We are in the 12th year of an extended technology collaboration with Monsanto, who continues to be an outstanding collaborator and investor. As outlined above, we look forward to continuing that collaboration well into the next decade by deploying a new suite of technologies and capabilities to drive new gene discovery, sustaining our track record of value creation. Mendel has some unique advantages as a technology provider to Monsanto, based in equal measures on a) the unique intellectual property and technology portfolio we provide, b) the platforms we have developed, c) our outstanding scientific staff, and d) our early successes in identifying pathways that have been successfully deployed in crops. We will not only identify new pathways in the coming years that increase plant performance, we will use our already successful pathways as a platform for focused value creation.

Over the next 20 years, major yield and performance improvements are projected from genomics and biotechnology in all major crops. The key to continued improvement in the long-term is to ensure that each biotech improvement can be effectively stacked with other mechanisms of crop improvement. Mendel's broad knowledge about plant pathways and their regulatory control enables us to ensure that the crops we produce, and those of our customers, can continually climb up "fitness peaks", rather than being locked into local peaks with reduced potential. Since such "fitness curves" (see below) depend on the specific environment in which a crop is grown, we must also ensure that we can produce varieties performing optimally in multiple curves targeting different overall environments.

Over the next several years, we intend to build upon *our foundation in plant pathway biology* by deploying the latest tools in computational and network biology to develop an understanding of gene regulatory networks in plants. Like a circuit diagram for an electrical appliance or an automobile, we are developing a biological circuit diagram that will provide an understanding of how our genetic technologies impact specific aspects of plant function, how multiple genetic technologies can be combined effectively, to provide insights for new inventions. In the past year, we made great strides with new technology platforms that we consider critical to the assembly of both local and global regulatory networks. We believe these new platforms and the insights we will develop with them will keep Mendel at the front of the innovation curve and provide major competitive advantage for genetic and chemical applications to crop improvement.

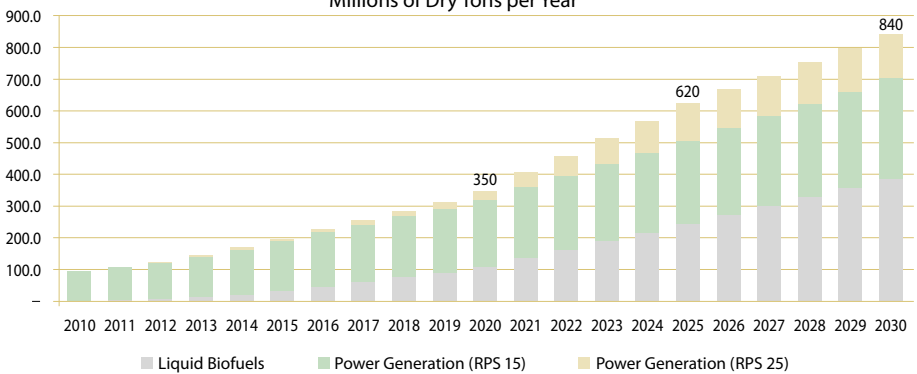


Mendel BioEnergy Seeds (MBS)

The global biofuels industry continued to grow at a rapid rate in 2008, with significant expansion in ethanol production from U.S. corn starch and Brazilian sugar. It is clear that other feedstocks and biofuel production technologies will be required to achieve material levels of biofuel production in the U.S. and globally. Specifically, maximizing the efficiency of light capture and liquid fuel production per acre is critical to the sustainable production of energy from renewable sources. This requires efficient conversion of a plant's entire biomass, not just a portion of it.

This fact has gained widespread recognition and is now reflected in U.S. energy policy. The Energy Independence and Security Act, signed into law December of 2007, mandates that a significant portion of U.S. transportation fuels be derived from cellulosic biomass. The market size for the feedstock component alone that will be required to meet this mandate is potentially well over five billion dollars by 2020. A dedicated crop which is a perennial – a plant that re-grows each year and does not require annual planting – is an ideal feedstock solution for lignocellulosic bioenergy, as annual energy and chemical inputs are minimized, and the period of light capture is extended compared to similar annuals.

Domestic Demand for Biomass
Millions of Dry Tons per Year



Our plant pathway biology platform will yield a major competitive advantage for Mendel's work on crop improvement through genetic and chemical means.

Mendel has therefore chosen to focus on C4 grasses (a class that includes, for example, *Miscanthus*, switchgrass, sugarcane, *sorghum*) as the primary focus of our future business serving the biofuels industry. And we have chosen to create a full product-to-the-market business, rather than relying on a technology development and licensing business model, to capture maximum value. This new business leverages the technology portfolio and knowledge of plant pathways that Mendel has developed as a technology company during our first 12 years in existence. Unlike some other businesses we've considered entering over the years, there are no significant barriers to entry and a true green field exists to develop our new business.

We began in 2005 on the development path to create what we refer to as our **BioEnergy Seeds** business. We recognized at the time that we would need significantly more growth capital than the company had available to pursue the opportunity and some new corporate competencies. We also recognized we would benefit in many ways from a collaboration with a potential future customer of our seed and feedstock products business. We entered into a long-term collaboration with BP in May of 2007 towards the development of this seeds and feedstocks business, largely focused on perennial grasses, and at the same time executed a financing that was led by BP.



Our future, low-carbon energy path
will be paved in part with cobblestones
made from perennial grasses.

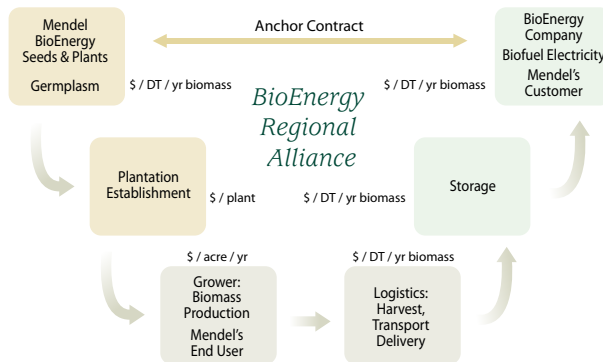
We have chosen to create a full product-to-the market business for the Bioenergy Seeds & Feedstocks opportunity, rather than relying on a technology development and licensing model.



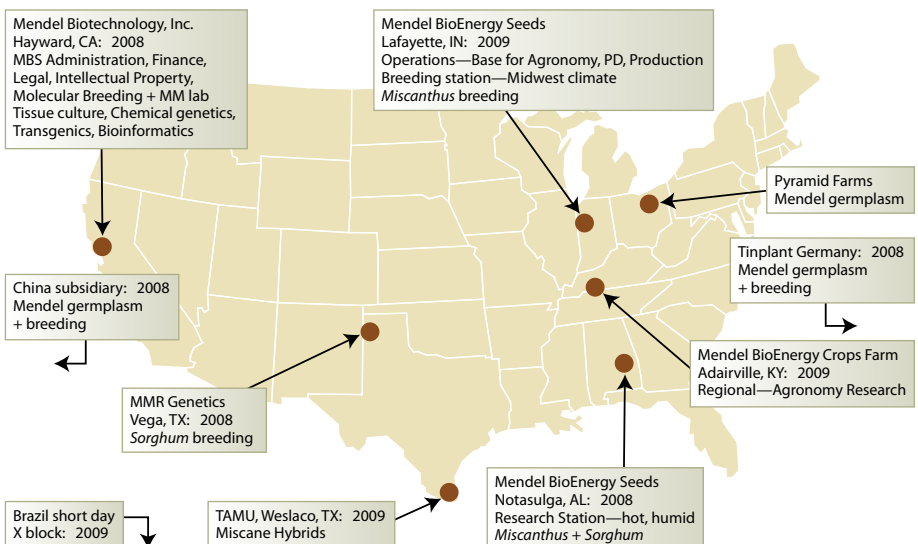
Mendel Product Portfolio

		Sorghum	Energy Cane/ Miscane	M X Giganteus	Mendel Miscanthus
SUSTAINABILITY	Efficient photosynthesis	✓	✓	✓	✓
	Low inputs		✓	✓	✓
	Adapted to marginal lands	✓	✓	✓	✓
	↑ soil C Sequestration		✓	✓	✓
	Genetic diversity	✓	✓	✓	✓
ECONOMICS	Yield > 10 dt per acre	✓	✓	✓	✓
	Low establishment costs	✓	✓		✓
	First year harvest	✓			
	Low production costs		✓	✓	✓

While the cellulosic bioenergy industry is in its infancy, we can envision likely future supply chain structure, from germplasm developers such as Mendel, through to the biorefineries or power companies that will consume the feedstocks produced by farmers from our plant and seed products (see below). Since the grasses have low density, we project that the dominant system will have a highly integrated and local structure, with as much as 40,000 acres serving a 50 million gallon/year biorefinery. Importantly, we envision that the biorefinery or power company will be our customer in this supply chain. Bio-era, a consulting firm, produced a report earlier this year which projected that over 250 such biorefinery-biomass systems will be in place by 2020. This offers the promise of a major market for Mendel's germplasm products.



We have established a new R&D site for MBS, in West Lafayette, Indiana, and we have further developed the research site located outside of Auburn, Alabama, near Auburn University. We now operate or collaborate at multiple locations globally, including in Texas with MMR Genetics, as indicated below.



Our Strategic Collaborators

I feel fortunate having top-notch, premier companies as collaborators for our two major business divisions: Monsanto for our Trait Technology business; BP for our BioEnergy Seeds & Feedstocks business. Our relationship structures and the role we play for each of these companies differ significantly.



Monsanto has an ongoing, premier seeds and ag biotech traits business, and we develop and license to them technologies for incorporation into their R&D pipeline. Monsanto funds

us to do this, and we receive royalty and milestone payments on the developed products – a fairly typical biotechnology industry relationship. We collaborate closely with Monsanto through the biotechnology/genomics group.



BP is developing advanced biofuels and foresees a need for the types of biomass feedstocks Mendel's crops will produce. Their funding is to support development of a new Mendel business, offering dedicated energy crops to refinery customers, including BP. The resulting BioEnergy Seeds business

will have BP as a preferred customer, but will have customers throughout the biofuels and power generation industries. We have begun to work closely with BP's Biofuels Business Unit in the past year, and have made significant strides in building an outstanding collaborative environment.

We entered into a collaboration with BP in 2007 to develop a BioEnergy Seeds and Feedstocks business to serve the emerging cellulosic biofuels industry.

Mendel has a number of other critical collaborations in the technology and seeds business segments:

Mendel joined forces with MMR Genetics/Richardson Seeds last year in a collaboration to develop sorghum varieties differentiated for the bioenergy industry. Our focus is to maximize cellulosic biomass rather than starch or protein, which should provide superior varieties for bioenergy production. MMR Genetics is a leading sorghum breeding company, established in the mid 1990's, associated with Richardson Seeds, one of the largest sorghum seed producers in the United States.

Bayer CropScience collaborates with us for the discovery of novel agrochemicals that improve plant performance. The program is a continuation of previous joint activities which focused on the elucidation of stress response mode of actions of Bayer agrochemicals like Imidacloprid and Trifloxystrobin. The program aims to discover and develop further chemical products that regulate plant stress tolerance, leveraging Mendel's knowledge of plant transcription factor pathways with the expertise of Bayer CropScience as a leader in agricultural chemistry. Bayer represents an excellent channel for commercialization of novel agrochemicals.

Mendel also has excellent collaborators for our other businesses, including Selecta Klemm as a partner in OBS for our ornamentals opportunity, and ArborGen and SweTree as collaborators in tree biotechnology and variety development.

Major Events of 2008

- **January–March.** Established an internal program to complete development of a new technology platform, focused on new gene discovery through application of computational biology to better understand plant regulatory circuitry.
- **May–June.** Established the first ever field trials of genetically diverse varieties of *Miscanthus* species for biomass production in the United States.
- **May.** Executed agreements with MMR Genetics and Richardson Seeds as the basis for a long-term collaboration to develop and distribute differentiated sorghum varieties targeted at bioenergy production.
- **December.** Mendel had its first technology product advanced to Phase III development by Monsanto, for soybean seed products to be commercialized in North and South America.

Future Prospects and Directions

Yogi Berra once said that “it’s tough to make predictions...especially about the future”. Never in my professional lifetime has this seemed so true. Will the market rebound in one year or five? Will demand drive the price of oil back towards \$100/barrel any time soon? Will the U.S. government pass legislation mandating cap and trade, and increased use of renewable energy sources? Will agricultural commodities increase in price, or will reduced demand put downward pressure on commodities and farmer inputs such as seed and genetics technologies?

Chance favors the prepared mind, and so we are preparing ourselves for a number of different futures consistent with our vision, mission, and values. We are carefully monitoring the financial, market and global economic conditions so that we can quickly recognize and adapt to the future as it unfolds. Given this uncertainty, we are managing cash carefully to maintain our strong financial position, while judiciously investing in the growth of our businesses. We continue to invest in people with key capabilities for this growth. Two key hires since the last Annual Report are Jeff McElroy, to head up our BioEnergy Seeds program as Vice President, and Ajay Sabherwal, to strengthen and lead our financial department as CFO. Jeff is a life-long breeder, most recently with Harris Moran, a vegetable seed company, and with extensive R&D management experience, and practical seeds industry experience. Ajay has extensive experience in financial leadership roles in both private and public companies, most recently serving as CFO at Aventine Renewable Energy.

Although the current global financial environment remains weak as I write this, we are broadly confident that our path, with a focus on critical technologies for improved agricultural productivity – including for bioenergy – remains a very good one.

I am proud to be a part of the Mendel team, and grateful to have the distinct pleasure of leading this organization towards realization of shared agricultural and energy visions through differentiated genetics.

Yours,



Neal Gutterson, Ph.D.
President & CEO
May 1, 2009

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UC Riverside



We can now use either genetics or chemistry to regulate traits of high value to farmers.

A man wearing a white t-shirt, blue jeans, a brown cowboy hat, and work gloves is holding the hand of a young child in a green shirt and blue jeans. They are standing in a grassy field. In the background, there is a green tractor with yellow wheels and a range of mountains under a clear sky.

Mendel Biotechnology

3935 Point Eden Way

Hayward, CA 94545

Phone 510-264-0280

Fax 510-264-0254

www.Mendelbio.com