Yield10 Bioscience, Inc.

(NASDAQCM:YTEN)

Investor Presentation

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October 11, 2019

Yield10, an Agricultural Bioscience Company using its "Trait Factory" to Develop High Value Seed Traits for the Agriculture and Food Industries

October 25, 2019

Safe Harbor Statement*

The statements made by Yield10 Bioscience, Inc. (the "Company," "we," "our" or "us") herein regarding the Company and its business may be forward-looking in nature and are made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. Forward-looking statements describe the Company's future plans, projections, strategies and expectations, including statements regarding future results of operations and financial position, business strategy, prospective products and technologies, expectations related to research and development activities, timing for receiving and reporting results of field tests and likelihood of success, and objectives of the Company for the future, and are based on certain assumptions and involve a number of risks and uncertainties, many of which are beyond the control of the Company, including, but not limited to, the risks detailed in the Company's Annual Report on Form 10-K for the year ended December 31, 2018 and other reports filed by the Company with the Securities and Exchange Commission (the "SEC"). Forward-looking statements include all statements which are not historical facts and can generally be identified by terms such as anticipates, believes, could, estimates, intends, may, plans, projects, should, will, would, or the negative of those terms and similar expressions.

Because forward-looking statements are inherently subject to risks and uncertainties, some of which cannot be predicted or quantified and may be beyond the Company's control, you should not rely on these statements as predictions of future events. Actual results could differ materially from those projected due to our history of losses, lack of market acceptance of our products and technologies, the complexity of technology development and relevant regulatory processes, market competition, changes in the local and national economies, and various other factors. All forward-looking statements contained herein speak only as of the date hereof, and the Company undertakes no obligation to update any forward-looking statements, whether to reflect new information, events or circumstances after the date hereof or otherwise, except as may be required by law.

***Under the Private Securities Litigation Reform Act of 1995**

This presentation highlights basic information about us and the offering. Because it is a summary that has been prepared solely for informational purposes, it does not contain all of the information that you should consider before investing in our company. Except as otherwise indicated, this presentation speaks only as of the date hereof.

This presentation does not constitute an offer to sell, nor a solicitation of an offer to buy, any securities by any person in any jurisdiction in which it is unlawful for such person to make such an offering or solicitation.

Neither the Securities and Exchange Commission (the "SEC") nor any other regulatory body has approved or disapproved of our securities or passed upon the accuracy or adequacy of this presentation. Any representation to the contrary is a criminal offense.

This presentation includes industry and market data that we obtained from industry publications and journals, third-party studies and surveys, internal company studies and surveys, and other publicly available information. Industry publications and surveys generally state that the information contained therein has been obtained from sources believed to be reliable. Although we believe the industry and market data to be reliable as of the date of this presentation, this information could prove to be inaccurate. Industry and market data could be wrong because of the method by which sources obtained their data and because information cannot always be verified with complete certainty due to the limits on the availability and reliability of raw data, the voluntary nature of the data gathering process and other limitations and uncertainties. In addition, we do not know all of the assumptions that were used in preparing the forecasts from the sources relied upon or cited herein.

We have filed a Registration Statement on Form S-1 with the SEC, including a preliminary prospectus dated September 9, 2019 (the "Preliminary Prospectus") and an amended Form S-1/A dated October 11, 2019, with respect to the offering of our securities to which this communication relates. Before you invest, you should read the Preliminary Prospectus (including the risk factors described therein) and, when available, the final prospectus relating to the offering, and the other documents filed with the SEC and incorporated by reference into the Preliminary Prospectus, for more complete information about us and the offering. You may obtain these documents, including the Preliminary Prospectus, for free by visiting EDGAR on the SEC website at http://sec.gov.

Alternatively, we or any underwriter participating in the offering will arrange to send you the prospectus if you request it by contacting Ladenburg Thalmann & Co. Inc., Attn: Syndicate Department, 277 Park Avenue, 26th Floor, New York, NY 10172 or by email at prospectus@ladenburg.com.

Yield10 Bioscience (NASDAQ: YTEN)

An Agricultural Bioscience Company which uses its "Trait Factory" to Develop High Value Seed Traits for the Agriculture and Food Industries

"The impacts of climate change on land will raise food prices and risk widespread food instability, but there are solutions," says latest UN IPCC Report Aug 2019

Near-term Milestones

Corporate and R&D Milestones	Period	Completed
• Initiate early development program in corn to evaluate novel traits	Jan 2019	✓
• Raise $2.9 million Registered Direct Offering – Common Stock only, At-Market Pricing	Mar 2019	✓
• Exclusive worldwide license with University of Missouri for tech to boost oil content	May 2019	✓
• New patent application filed on high level PHA production in the oilseed Camelina	July 2019	✓
• Expand research license with Bayer for evaluation of a novel C3004 yield trait in soybean	Aug 2019	✓
• Expand trait research licensing to a market leader in an additional crop—Simplot/Potato	Oct 2019	✓
• R&D Services Agreement	Q4 2019	
• Field data for Canola C3003	Q4/Q1 2020	
• Field and research data for Camelina C3004	Q4/Q1 2020	
• Field and research data for CRISPR genome edited oil content traits	Q4/Q1 2020	
• Expand trait research licensing to market leader in an additional crop	Q1/Q2 2020	

Yield10 Additional Upcoming Milestones

Yield10 is working to advance our crop technologies and form collaborations

- **Performance Traits**
  - Expand trait licensing to additional Ag majors to maximize acreage for yield traits
  - Support Bayer, Forage Genetics, Simplot and other Ag majors in their development
  - Progress commercial development of C3003 in canola and other crops (soybean, corn)
  - Report on C3004 Camelina 2019 field tests, fast-track into canola and corn
  - Report progress on oil boosting traits using CRISPR genome editing

- **Camelina Product Platform**
  - Develop the business plans and partnerships for the Camelina platform
  - Build our intellectual property portfolio

- **GRAIN Platform**
  - Secure revenue generating R&D collaborations
  - Build our intellectual property portfolio
  - Communicate our scientific innovations in technical presentations and papers

Yield10 BIOSCIENCE

Path to Commercialization

Trait Factory – Products and Path to Revenue

The "Trait Factory" leverages 26 years of Technology investment/achievements

Platform	Products	Path to Market & Revenue Model	Partners	Revenue Potential
Trait Factory	R&D Services, Trait gene discovery Product optimization	Funded R&D agreements Milestone payments License revenue	future future future	$1-6 million + future royalties
Performance Traits	Seed yield (genes)	Multi-year field trials in canola, soybean, corn Licensing to Ag majors	Bayer CropScience, Forage Genetics	$1-3 billion
	Oil content (genes)		Simplot future	$100-200 million
Specialty Products	Nutritional oils	Value chain partners Field trials, product development Seed sales, product sales	future future	TBD
	PHA biomaterials			$10 billion

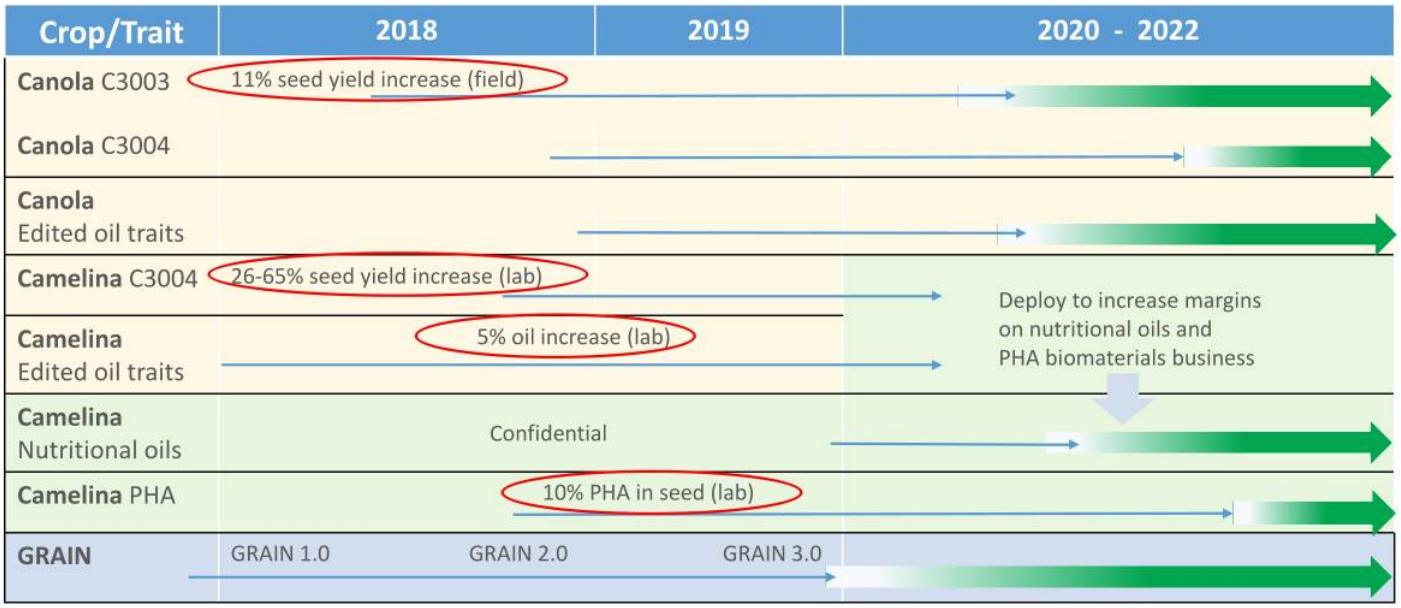
"TRAIT FACTORY"

"GRAIN"[1] Gene discovery – crop genetic engineering

[1] Gene Ranking Artificial Intelligence Network

Trait Progression to Revenue Generation

GRAIN Platform has produced a rich portfolio of performance traits and enables product opportunities



Indicates where traits are in the development process in the specific crops. Indicates potential timing to revenue generation

Note: The "Development" process encompasses engineering the trait into the crop of interest, developing initial field data and line selection to identify the best events for transfer into elite varieties before additional field testing. The goal is to generate multi-site, multi-year performance data or sufficient data to incentivize an Ag major to invest their resources in progressing the trait.

Trait Progression – Partner Activities

Working with Ag Majors to maximize addressable acreage for performance traits

Crop/Trait	Partner	Agreement	2018 - 2021
Soybean/C3003 Soybean/C3004	Bayer CropScience	**Research License Collaboration**	C3003 Development C3004
Sorghum Multiple traits	Forage Genetics International	**Research License Collaboration**	Development Field test
Corn Multiple Traits	**Ag Co** Leader in corn genetic engineering/germplasm	**Fee For Service**	Development Field test
Potato Multiple Traits	Simplot	**Research License**	Development

Yield10: Rich Pipeline of Trait Genes in Development

Many opportunities exist for licensing and/or partnerships

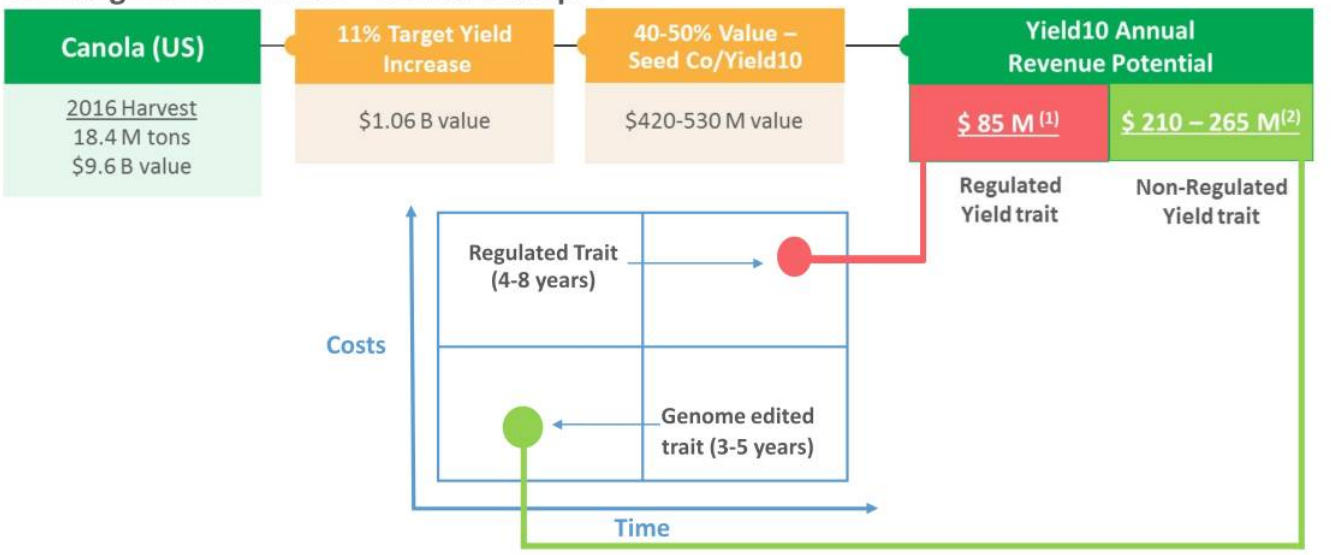
Traits	Target Crops	Potential Acres (N. America)	Annual Revenue Potential
Seed yield			
C3003, C3004	canola, soybean[1], corn,	200 million	$1-3 billion
Oil content – focus on genome editing targets			
C3007 - C3010, C3012	Camelina, canola, soybean	120 million	$100-200 million[2]
Products			
Nutritional Oils	Camelina	10 million	TBD
PHA Biomaterial	Camelina	20-30 million	> $10 Billion
GRAIN Trait Gene Discovery			
R&D Agreements	TBD	-	$1-6 million

1. An additional 130 million acres of soybean potential in S. America.
2. Based on a trait value calculated as 10-20% of the value of a 10% increase in oil content and the oil value from the 2017 soybean crush in the US to produce $7.15 billion of soybean oil and the 2017 Canadian canola crush to produce $3.08 billion of canola oil.
   United Soybean Board statistics and Canola Council Statistics

Licensing Revenue Model

Traits can be deployed using traditional genetic engineering or genome editing tools

Licensing revenue model – canola example



1. http://www.statcan.ga.ca/daily-quotidien/161206/dq161206b-eng.htm, AAFC projected canola price 2016-2017 is $520/tonne.
2. Assumptions: Regulated Yield10 trait: target of 5-12% of the value add for yield traits; used 8% in calculations. 3. Deployment of a non-regulated yield trait through genome editing (revised USDA-APHIS rules) could enable Yield10 to capture a greater proportion of value add based on faster time to market and lower development costs, 20-25% of the trait value (50% of the value that goes to the Seed Co/trait provider)used in the calculation for illustrative purposes.

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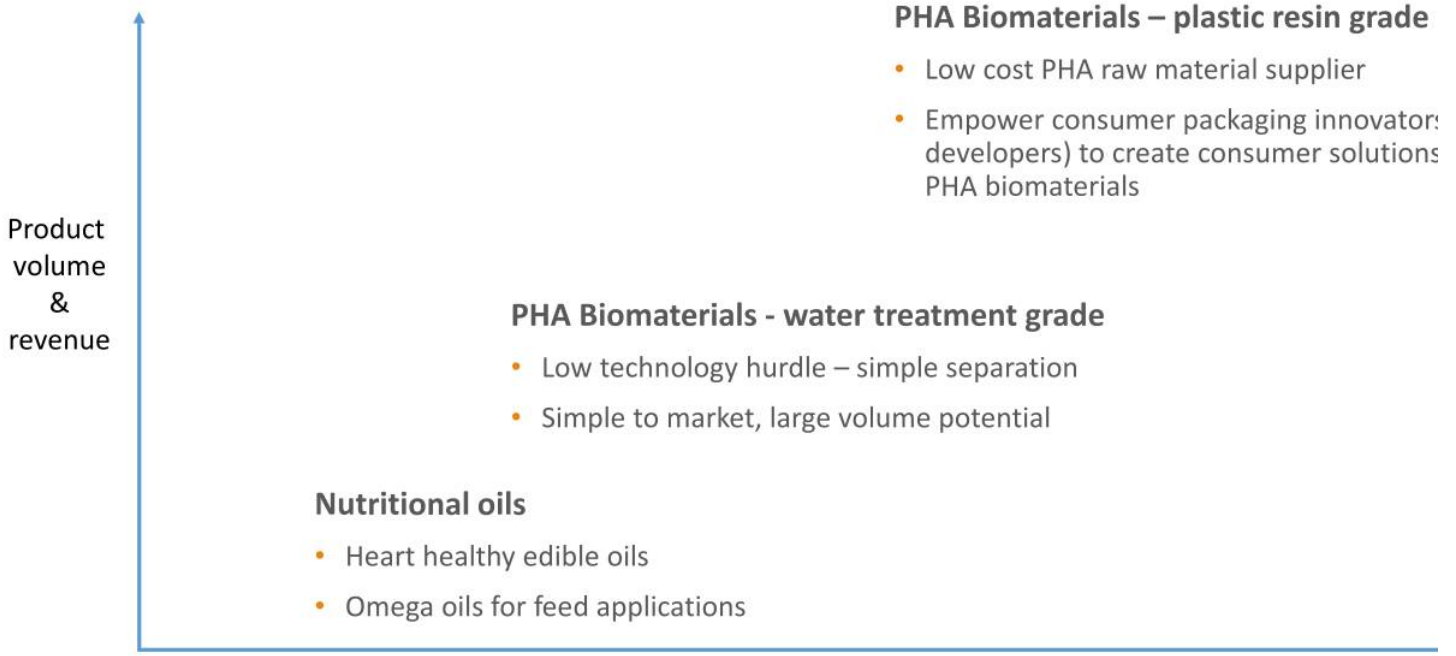
Camelina Platform

Market Opportunity & Development

Camelina Products – Market Development Strategy



A Compelling Market Opportunity

Yield10 develops high value performance traits and specialty crop products

Efficiently developing performance and product traits for major crops

Global Food and Ag is a **~ $5 trillion market today**

Milling/Food Manufacturers | Seed Co | Farmers | Supermarket

Food production has to increase by 70-100% by 2050[1]
Increased overall demand, increased protein consumption

Breakthrough grain crop yield traits are essential for global food security

Traits increasing yield by 10-20% would b disruptive to the seed industry

Intensification of agriculture increases the environmental burden on land and water

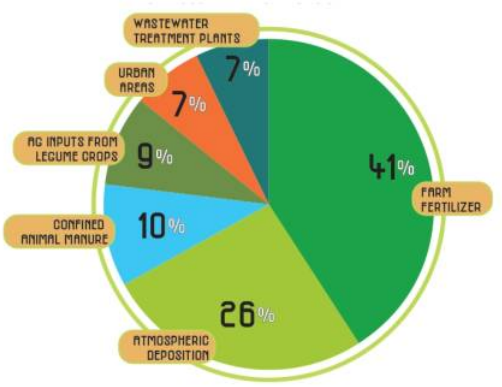
1. https://www.mckinsey.com/~/media/McKinsey/Industries/Private%20Equity%20and%20Principal%20Investors/Our%20Insights/Global%20agricultures%20many%20opportunities/Global%20agricultures%20many%20opportunities.ashx

Nutrient Run-Off Impacts Human Health and the Environment

Human health

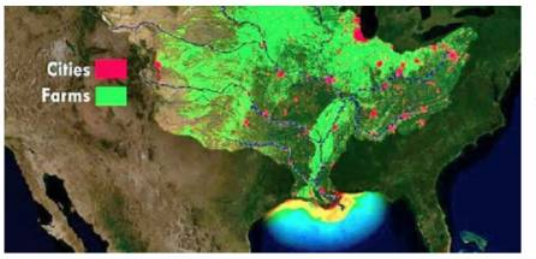
"Considering all studies, the strongest evidence for a relationship between drinking water nitrate ingestion and adverse health outcomes (beside methemoglobinemia) is for colorectal cancer, thyroid disease, and neural tube defects. Many studies observed increased risk with ingestion of w nitrate levels that were below regulatory limits." **Mary H. Ward et., al. 2018:** International Journal of ***Environmental Research and Public Health; 15, pp. 1557***

Environment



Sources of Nitrogen Delivered to The Gulf of Mexico

https://www.usgs.gov/special-topic/water-science-school/science/nitrogen-and-water?qt-science_center_objects=0#qt-science_center_objects



Dead zone in Gulf of Mexico linked to nutrient inputs from cities and farms in Mississippi River Basin

- *Nutrient runoff into Gulf causes algal blooms*
- *Decomposition of algae creates low oxygen levels that kill fish and marine life*

https://www.workboat.com/news/coastal-inland-waterways/noaa-sees-very-large-dead-zone-for-gulf-of-mexico/

Cash Cover Crops – The Camelina Platform

The oilseed Camelina has large acre potential as a cash cover crop

- Cover crops can be planted after the main crop harvest
- A second crop from the same land increases productivity
- Cash cover crops can increase farm revenue and reduce nutrient run-off
- Engineered product traits can make Camelina an attractive cash cover crop
- Potential for favorable regulations under revisions to USDA-APHIS 7CFR part 340
  - Readily segregated from commodity crops
  - Prioritize US production, processing and sales

Camelina Platform for Producing PHA Biomaterials

Yield10 has made significant progress in achieving plant-based production of the simplest member of the natural PHA biopolymer family

Problem	PHA Biomaterial Market Opportunity
Water nutrient pollution (nitrate/phosphate)	• PHA a natural biodegradable product for denitrification of water systems
Plastic pollution	• PHA a natural biodegradable replacement for plastics

Market adoption severely restricted by current production costs

Solution: High PHA production in oilseeds enables low cost PHA

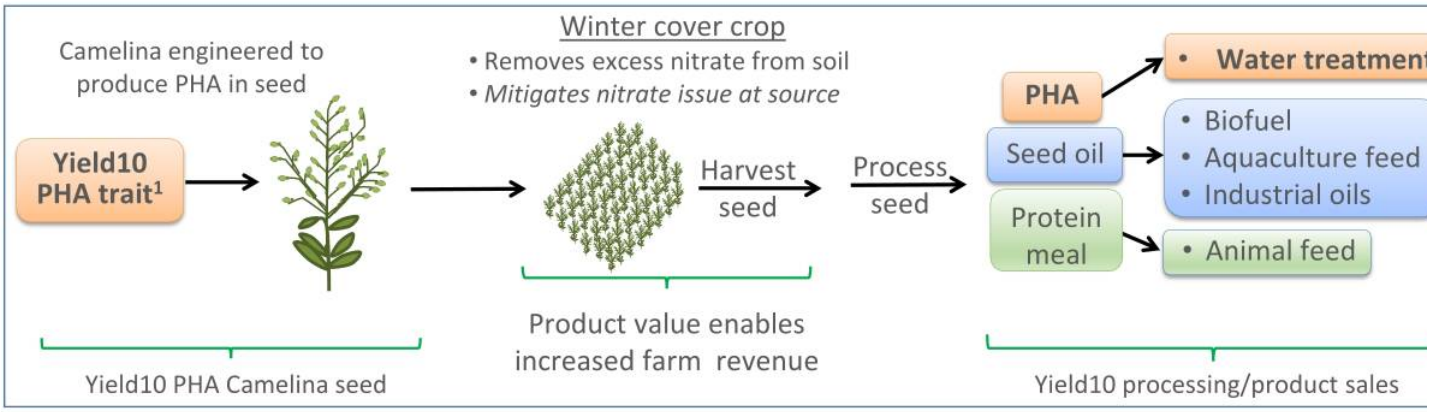
- **PHA-producing Camelina has significant advantages including:**
  - Reduce nutrient runoff at its source in the field - increase farm revenue
  - Low cost sustainable production of PHA biomaterials

Production of Polyhydroxyalkanoate (PHA) in Oilseeds

PHA cash cover crop: Harnessing nature to heal nature

Cash cover crop mitigates nutrient runoff in field, produces PHA biomaterial product for water treatment

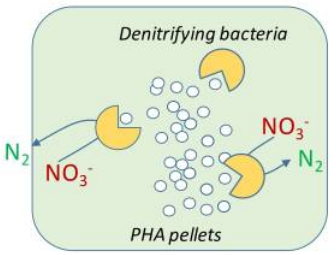
Camelina based PHA biomaterials value delivery chain



1. Patent pending

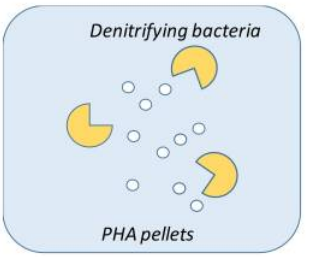
Clean Water: PHA Water Treatment Applications

- PHA is a natural part of the carbon/nitrogen cycle in water treatment facilities
- A PHA nitrate removal system is self-regulating, requires minimum maintenance



High nitrate = algal growth

Bacteria consume PHA and convert nitrate to nitrogen in the air
~15 lbs of PHA will remove ~5 lbs of nitrate from 1000 gallons of water



Low nitrate = NO algal growth

Potential Market Opportunities

Market Segment	Key Metrics
Recirculating aquaculture systems	20 ktpa for tilapia and salmon smolt globally
Septic systems (Distributed On-Site Wastewater treatment systems, OWTS)	• Florida has ~2.5M septic systems (~12% of the total in the US), ~75 kg nitrate/yr released from each system • Illustrative case: to eliminate all nitrate from septic systems in Florida would require ~3-4 million acres of PHA Camelina to produce ~1 billion lbs of PHA[1]

1. Numbers for illustrative purposes only, assumes PHA Camelina technology nearing maturity

Yield10 BIOSCIENCE

Capitalization & Executive Team

Capitalization Table

Ownership Table as of October 2, 2019		
Holder	# of Common Shares	% of Common Shares
Jack Schuler	3,804,885	30.3%
Officers and Directors as a group	243,590	1.9%
Public Float	8,519,107	67.8%
Total Common Shares Outstanding	12,567,582	100.0%

Capitalization Table as of October 2, 2019	
Security	# of Common Equivalents
Common Shares Outstanding	12,567,582
Options (WAEP $4.50) [1]	2,484,475
Warrants[2]	7,039,784
Fully Diluted Shares	22,091,841

1. Stock Option Plan. Employees, officers and directors hold options exercisable for >10% of shares outstanding
2. Exercise price for 6,439,000 is $2.25; Exercise price for 570,784 is $5.04; Exercise price for 30,000 is $2.90

Executive Team

Oliver Peoples, Ph.D. President & CEO, Director	Dr. Peoples is a pioneer of the field of metabolic engineering, the forerunner of synthetic biology, which began at MIT in the mid 1980's and an experienced entrepreneur and biotechnology executive with over 35 years of experience in science and technology innovation, intellectual property development, partnerships and commercialization.
Kristi Snell, Ph.D. CSO & VP Research	Dr. Snell brings over 20 years of experience and industry recognized expertise in metabolic engineering of plants and microbes for the production of novel products and increased plant yield. Following her post-doctoral research at MIT, Dr. Snell joined Metabolix in 1997 to lead the plant science research program.
Charles Haaser VP, Finance & CAO	Joined the Company in 2008 as corporate controller and was named chief accounting officer in 2014. He has over 30 years of senior accounting management and executive experience with public technology-based companies. His strong professional background includes technical accounting, SEC financial reporting, Sarbanes-Oxley and tax compliance.
Lynne Brum VP, Planning & Communications	Joined the Company in 2011 as vice president of marketing and corporate communications, bringing over 25 years experience in the life science industry including roles in corporate communications, investor relations, financial planning and corporate development.

Board of Directors (non-executive)

Robert Van Nostrand Chairman	Chairman of the Board since October 2013, Director since 2006. Spent 21 years with OSI Pharmaceuticals where he held various roles including CFO.
Prof. Anthony Sinskey, Ph.D.	Director since June 1992, a co-founder of Metabolix, Inc. MIT faculty Department of Biology, 1968 to present. Science advisor to multiple biotech Co's including Genzyme, OSI, Merrimack Pharma, Tepha, Inc.
Richard W. Hamilton, Ph.D.	Served as a Director since March 2017. From 1998 to 2016 he held various leadership roles at the Ag biotech Co Ceres Genomics Inc. including CEO and a member of the board of directors.
Peter N. Kellogg	Director since March 2007. 2014 to present he served in various executive positions at Celgene, most recently Chief Corporate Strategy Officer. CFO of Merck from 2007-2014, and Biogen from 2000-2007.
Joseph Shaulson	Director since December 2013. CEO of Metabolix, Inc. January 2014-October 2016. Prior to that, he held various leadership and operating positions at Arch Chemicals and Hexcel Corporation. He previously served as a corporate associate at the law firm Skadden Arps.

Sherri Brown, Ph.D. Special Advisor	Named Special Advisor to the board of directors in December 2018. Currently Managing Director of The Yield Lab. Served in a number of leadership positions at Monsanto from 1989 to 2017 most recently as Vice President, Science Strategy and as a member of the Monsanto Leadership Council.

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