Yield10 Bioscience, Inc.

(NASDAQCM:YTEN)

LD Micro Presentation

Yield10 is developing new technologies to achieve step-changes in crop yield to enhance global food security

June 5, 2018

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, 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, 2017 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**

Investment Considerations

"Yield10 develops food and feed crops to produce higher yields with lower inputs of land, water or fertilizer"

Leverages a large historical investment in advanced metabolic engineering into the Ag space

- 16 recent patent applications for increased crop yield

Applying a productive technology/knowledge base with genome editing

Significant, near-term milestones

- Data from field tests of C3003 in Camelina, canola and potentially soybean expected in 2018
- Progressing oil enhancing traits using CRISPR genome editing

Numerous opportunities for value capture

Has an organization structured to achieve upcoming milestones

Headquartered in Woburn, MA USA; Oilseeds center of excellence in Saskatoon, Canada

NasdaqCM: YTEN

Leadership Team

Oliver Peoples, Ph.D.
CEO

- Founder and CSO of Metabolix, an MIT spinout, Dr. Peoples is an experienced entrepreneur and biotechnology executive with over 30 years of experience in science and technology innovation and commercialization
- He initiated the crop science program over a decade ago and more recently spearheaded the development of Yield10's research and business focus

Kristi Snell, Ph.D.
VP Research & CSO

- Previously VP of Research and Biotechnology at the Company with 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 where she has led the plant science research program since its inception

Charles Haaser
VP, Finance & CAO

- Joined the Company in 2008 as corporate controller and was named chief accounting officer in 2014
- Has more than 30 years of senior accounting management and executive experience with public technology-based companies
- 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 marketing and corporate communications
- Has more than 25 years experience in the life science industry including roles in corporate communications, investor relations, financial planning and corporate development

Recent Accomplishments

- ✓ Granted research license to Monsanto for evaluation of C3003 & C3004 in soybean
- ✓ Completed planning and permitting for 2018 field tests of C3003 and C3008a
- ✓ Completed genome-edit of 3 gene targets involved in oil biosynthesis
- ✓ Two recent publications highlight Yield10 technology and targets for genome-editing
- ✓ Filed patent application on using GTFs to boost seed yield in corn
- ✓ Signed exclusive worldwide license agreement with University of Missouri for advanced technology for boosting oil content in oilseed crops (C3007, C3010)

Yield10: A Compelling Market Opportunity

Yield10 is……Aligned with compelling megatrends

Global Food Security……increasing demand and increased protein consumption

Health and Wellness……improved nutrition

Food Safety and Sustainability……"farm to fork " value chain

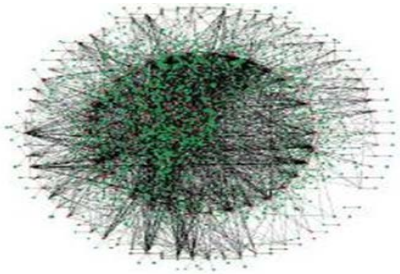
UNITED NATIONS
June, 2015 GA/EF/3242
Food Production Must Double by 2050

Commercial Strategy

Yield10 technologies enable multiple paths to value creation







North American Commodity Crops

- Accelerate deployment with Ag majors
- Provide low hurdle to deploy and test yield traits in elite germplasm
- License agreements with milestones and participation in downstream economics

Specialty and Niche Crops including Nutritional Oils

- Form collaborations based on combining technologies to improve yield and/or improve nutritional value
- Focus on development of new products in food and animal feed
- Utilize technologies enabling a non-regulated path to market
- JV-type agreements with significant share of downstream economics

Yield10 Technology Platforms

- Accelerate innovation based on unique approach to identifying gene combinations for editing
- Access government grants and relationships with leading plant scientists
- R&D support for partner funded programs

Value Creation Model: Seed Yield and Oil Content

Yield10's gene traits may enable value creation through step-change increases in crop yield

An illustrative example of the annual revenue opportunity for Yield10's canola, soybean and corn gene traits based on the 2016 harvest.

For Soybean: Additional market opportunity emerging for High Oleic soybean oil. As genome editing traits deployed, a role for genome editing traits to boost oil biosynthesis (in range of 20%) could drive additional value for growers and Yield10.

Canola[1] (Can)	Soybean[2] (US)	Corn[2] (US)
2016 Harvest $18.4 M tons $9.6 B value	2016 Harvest $4.36 B bu $40.1 B value	2016 Harvest $15.2 B bu $50.2 B value
20% Target Yield Increase	20% Target Yield Increase	10% Target Yield Increase
+$1.92 B value	+$8.01 B value	+$5.16 B value
40-50% Value - Seed Co/Yield 10	40-50% Value - Seed Co/Yield 10	40-50% Value - Seed Co/Yield 10
$0.77 - $0.96 B value	$3.2 - $4.0 B value	$2.0 - $2.6 B value
Yield10 Target[3]	Yield10 Target[3]	Yield10 Target[3]
$65 - $82 M potential revenue	$272 - $340 M potential revenue	$170 - $221 M potential revenue

USDA projected on-farm corn price 2016-2017 is $3.30/bu
USDA projected soybean price for 2016-2017 is $9.20/bu
AAFC projected canola price 2016-2017 is $520/tonne

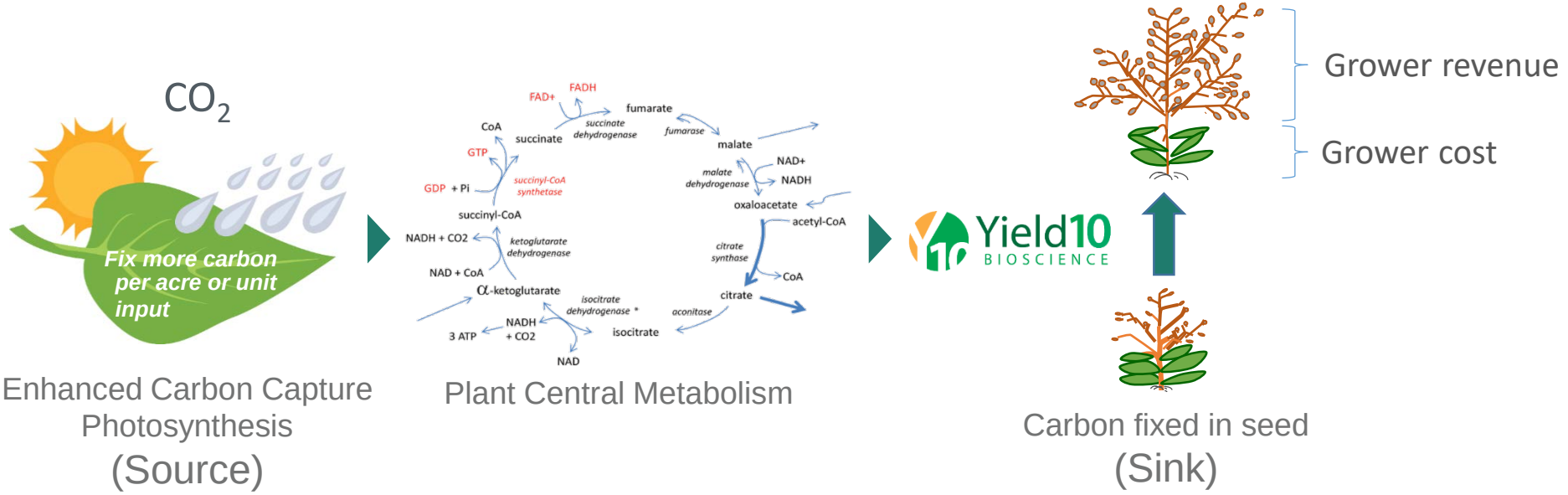
1. http://www.statcan.gc.ca/daily-quotidien/161206/dq161206b-eng.htm
2. https://www.nass.usda.gov/Newsroom/2017/01_12_2017.php; High Plains/Midwest AG Journal, Jan. 19, 2017
3. Yield10 target of 5-12% of the value add for yield traits; used 8.5% in calculations

Yield10 | BIOSCIENCE

Yield10: Our Technology Approach

Fundamentally increasing crop yield is a complex two step carbon optimization problem

1) Increase the rate of carbon fixation in crops having the C3 (e.g. soybean) and C4 (e.g. corn) photosynthetic systems
2) Directing the increased fixed carbon to the harvested part of the plant, mostly seed



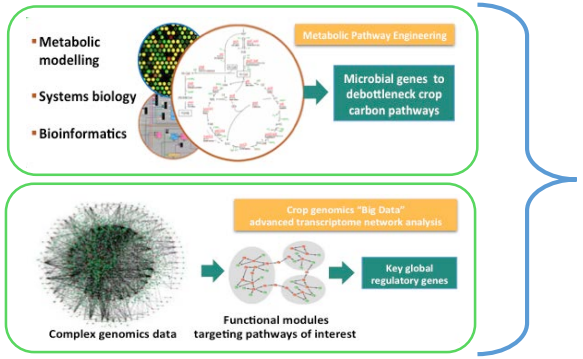
"Enhanced Carbon Capture >>>>>> Targeted Carbon Deposition"

“GRAIN” Trait Gene Discovery Platform

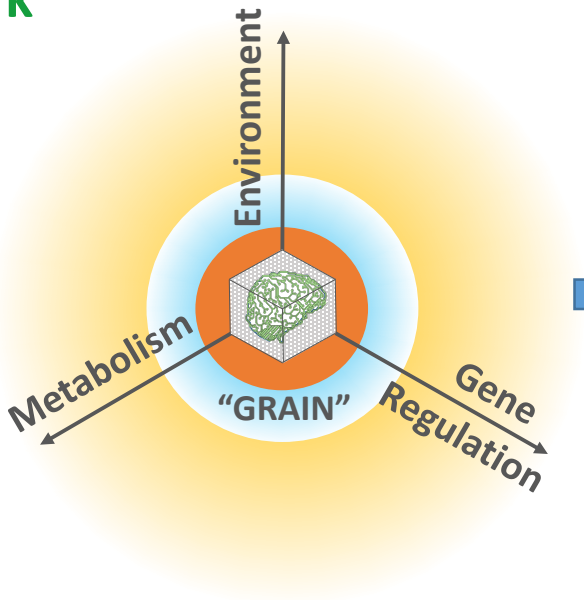
GRAIN: Gene Ranking Artificial Intelligence Network

“roadmap” analogy

“Crop Smart Carbon Grid”



“T3 Platform “



Gene Targets

- We are developing “GRAIN”, a “Waze” or “Google Earth”-like system for identifying gene targets
- Integrating three key technology elements:
  - Metabolic engineering or synthetic biology, the “Crop Smart Carbon Grid” (carbon conversion infrastructure)
  - Transcriptome network analysis, the “T3 Platform “ (gene regulators or traffic lights) – C4001-C4003 traits
  - Powerful feedback loops incorporating data from high yield lines
- We are progressing gene targets from elements of the GRAIN platform (C4004-C4026: C3011 and C3012)

Rich Pipeline of Trait Genes in Development

SUMMARY OF OUR CROP TRAITS IN DEVELOPMENT	
Business Area	**Current Status**
Seed Yield Traits-Regulated	
C3003	Camelina 1st and 2nd generation at field testing stage Canola 1st and 2nd generation at field testing stage Soybean and rice in development
Seed/Oil Enhancing Traits-Non-Regulated	
C3004	Camelina testing underway
C3007	Camelina, canola editing underway
C3008a	Camelina non-regulated[1] status achieved; at field testing stage
C3008a, C3008b and C3009 combinations	Camelina, editing of all 3 gene targets completed
Additional oil trait combinations	Research in progress
Yield Improvement Discovery Platform	
C4001	Wheat program underway Rice transformation underway Corn transformation next step
C4002	Corn transformation next step
C4003	Wheat program underway Rice transformation underway Corn transformation next step
C4004	Editing in rice and wheat underway

Many opportunities exist for licensing and/or partnerships

[1] not regulated by USDA-APHIS, could be regulated by EPA and/or FDA

C3003: Field Test Program 2017-2019

We have engineered Camelina and canola to express C3003 from constitutive (Gen 1) or seed specific (Gen 2) promoters

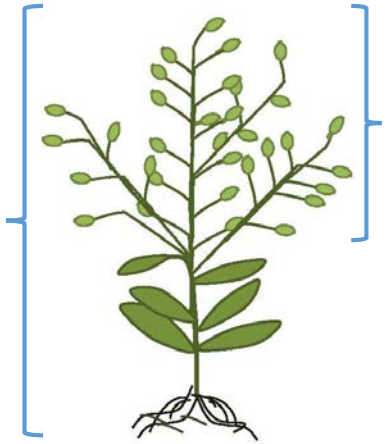
Crop/Trait	Year		
	2017	2018	2019
Camelina Gen 1 C3003	▪ 2016 field test data reported *(up to 23% seed yield increase)*	▪ N/A	▪ N/A
Camelina Gen 2 C3003	▪ Greenhouse *(up to 24% seed yield increase)* ▪ 2017 field test (*up to 7% seed yield increase*)	▪ Field tests (data Q4)	▪ Field tests Gen 2.0, 2.1
Canola Gen 1 C3003	▪ 2017 field test (*up to 13% seed yield increase)*	▪ Field tests (data Q4)	▪ TBD
Canola Gen 2 C3003		▪ Greenhouse data ▪ Field tests (data Q4)	▪ Field tests Gen 2.0, 2.1
Soybean Gen 1 & Gen 2	▪ Greenhouse data from early generations	▪ Small scale field plots	▪ Field tests
Rice Gen 1 & Gen 2		▪ Greenhouse studies	▪ Greenhouse studies

2018 Field Test Plan for C3003 and C3008

Conduct Field Tests of C3003 in Camelina, canola; Bulk-up soybean seed

Generate technical data and determine the best way to deploy C3003 in canola and soybean

- Test C3003 Gen 2.0 and Gen 2.1 in Camelina
- Test C3003 Gen 1.0 and Gen 2.0 in canola
- Grow C3003 Gen 1.0 and Gen 2.0 soybean to generate field grown seed for 2019
- Multiple sites in Canada



Conduct Field Test of Genome-edited C3008 in Camelina

- Begin to generate data on component traits to be used in multi-trait stack
- C3008a may be a useful target in trait stack intended to increase oil yield and improve lipid quality
- First field test of this trait in 2018; Conduct test in U.S.
- Obtained non-regulated status in 2017

Novel Traits for Boosting Seed Oil Content

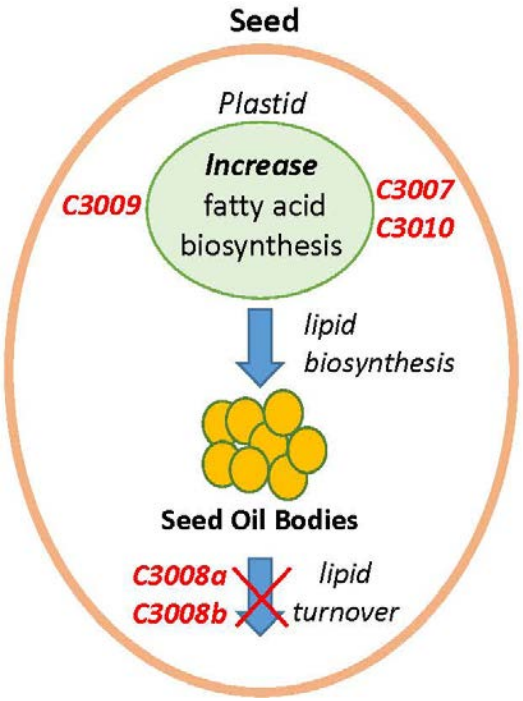
Yield10 is re-engineering the oil biosynthesis pathway in oilseed crops

Current Status

- Boosting oil yield per acre significantly increases the value of the crop to the grower
- Identified 5 targets involved in oil biosynthesis pathway
- Recently completed in-license of C3007 and C3010; Generating IP
- Traits accessible through genome-editing (non-GMO), reducing development cost and time associated with commercialization
- Potential to stack with composition traits (e.g. high oleic, omega fatty acids)
- Obtained first non-regulated[1] trait (C3008a) via a submission to USDA-APHIS in 2017
- Completed stacking of multiple edited traits in one line (eg. C3008a, C3008b, C3009)

Next Steps

- Edit additional genes including C3007 and/or C3010 to boost oil content
- Make submissions of traits/plants to USDA-APHIS to enable non-regulated US field tests
- Conduct field tests to generate data in oilseed crops
- Identify opportunities for licenses and collaborations for specialty oil seed crops



[1] not regulated by USDA-APHIS, could be regulated by EPA and/or FDA

Recent Publications Highlight Our Differentiated Approach

ELSEVIER

Plant Science

Available online 14 March 2018

In Press, Corrected Proof

Metabolic engineering to increase crop yield: From concept to execution ☆

Frank A. Skraly, Madana M.R. Ambavaram, Oliver Peoples, Kristi D. Snell

Show more

https://doi.org/10.1016/j.plantsci.2018.03.011

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ELSEVIER

Plant Science

Available online 7 April 2018

In Press, Corrected Proof

Novel transcription factors *PvBMY1* and *PvBMY3* increase biomass yield in greenhouse-grown switchgrass (*Panicum virgatum* L.) ☆

Madana M.R. Ambavaram, Aminat Ali, Kieran P. Ryan, Oliver Peoples, Kristi D. Snell, Maria N. Somleva

Show more

https://doi.org/10.1016/j.plantsci.2018.04.003

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Key Findings:

- C4001: Leaves & stems,75%-100% increase; Roots, 85-140% increase
- C4003: Leaves & stems, 100-160% increase; Roots, ~40% increase

Progressing C4000 Series Traits Generated from T3 Platform

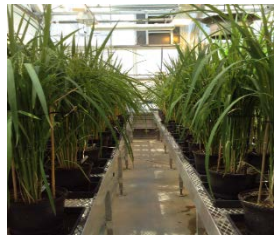
Yield10 is uniquely positioned to identify valuable targets based on global transcription factors

Current Status

- Published data showing that C4001 and C4003 significantly boost key parameter of photosynthesis and improve plant biomass in switchgrass
- Conducting studies with C4001 and C4003 in rice and wheat
- Foundational IP filed and generating additional IP on C4004 plus series traits

Next Steps

- Generate data for C4001 and C4003 traits in rice and wheat to identify new genome-editing targets
- Begin corn transformations to enable greenhouse and field tests



Genome Editing in Agriculture

REGULATION

USDA greenlights gene-edited crops

Agency says techniques like CRISPR are equivalent to traditional plant-breeding methods

by Melody M. Bomgardner

APRIL 9, 2018 | APPEARED IN **VOLUME 96, ISSUE 15**

c&en
CHEMICAL & ENGINEERING NEWS

A Breeding Revolution

As Gene Editing Nears the Field, Regulators and Consumers Lag Behind

4/27/2018 | 7:55 AM CDT

By Emily Unglesbee , DTN Staff Reporter

Connect with Emily:

@Emily_Unglesbee

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GENETICS

The USDA Just Gave the Green Light to CRISPR'd Food

Kristen V. Brown

3/30/18 2:34pm • Filed to: CRISPR

GIZMODO

- Obtaining **non-regulated** status reduces development costs and timelines[1]
- "GRAIN" trait gene discovery platform identifies "**Smart Editing Targets**"

[1] https://www.aphis.usda.gov/aphis/ourfocus/biotechnology/sa_brs_vpm/340-peis

Upcoming Milestones

Yield10 is working to advance our crop yield technologies and build collaborations

- Continue progress on C3003 with additional constructs and crops
  - Execute 2018 field testing of C3003 in Camelina and canola in Canada
  - Expect planting in 2Q 2018 and first results in 4Q 2018
  - Monsanto is developing the C3003 trait in soybean
  - Continue independent evaluation of C3003 in soybean and rice
- Advance oil boosting traits
  - Progress oil enhancing traits using CRISPR genome-editing including C3004, C3007, C3008a/b, C3009 and C3010 for increased seed yield and seed oil content; make submissions to USDA-APHIS to enable US field tests
- Progress C4000 series traits into key crops
  - Continue work with C4000 series traits in rice, begin work on C4000 series traits in corn
  - Progress genome-editing of select C4000 series traits in rice
- Secure Ag industry collaborations and non-dilutive sources of funding
- Build our intellectual property portfolio
- Communicate our scientific innovations in technical presentations and papers

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