Yield10 Bioscience, Inc.

(NASDAQCM:YTEN)

Corporate Presentation: Pioneers 2017 Conference

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

May 2017

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, 2016 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**

Company Overview and Objective

Yield10 Bioscience is developing technologies to enhance global food security

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

Yield10 is bringing extensive expertise and track record in optimizing the flow of carbon in living systems to the agriculture sector to increase yield in key row crops

- Yield10 is targeting step-change, or 10-20% increases, in seed yield
- Our technology is based on 15 plus years of cutting edge crop metabolic engineering research
- 10 recent patent applications for increased crop yield
- Initial development targets include canola, soybean and corn
- Additional market opportunities include licensing or partnering in other crops

Yield10 will focus on its core strengths of advanced bioscience and innovation

- Discover and develop proprietary crop yield technologies and de-risk them by developing proof points in canola, soybean and corn to optimize value capture from licensing or acquisition

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

- Outlined plans for Spring 2017 field tests of C3003 trait in Camelina and canola
- Reported promising greenhouse results for second generation C3003 trait in Camelina
- Appointed Richard Hamilton to Board of Directors
- Expanded scientific team with two key hires
- Executed exclusive option with Univ. of Missouri to evaluate genome editing target for oilseed crops
- Reported 2016 Camelina Field Test Results for C3003 showing a significant increase in seed yield
- Renamed and re-branded the company as Yield10 Bioscience (YTEN)

Yield10: A Compelling Market Opportunity

Crop yield is the key value driver in the Ag sector and the key to addressing food security

Y10 is…aligned with compelling megatrends

- Global population growth from 7 billion to over 9.6 billion by 2050
- Need 70% increase in food production by 2050
- Traditional crop breeding cannot solve this problem[1]

9 October 2009
Revised June, 2015
GA/EF/3242

Food Production Must Double by 2050 to Meet Demand from World's Growing Population

Ag Sector… consolidation

- Top 5 Ag players becoming the top three
- Need to fill product development pipelines

Need…Innovation and new technology approaches

- Advances in metabolic engineering (synthetic biology)
- Advanced genome editing technologies e.g.CRISPR/Cas9

Regulatory…traits developed using specific genetic engineering approaches may be unregulated [2]

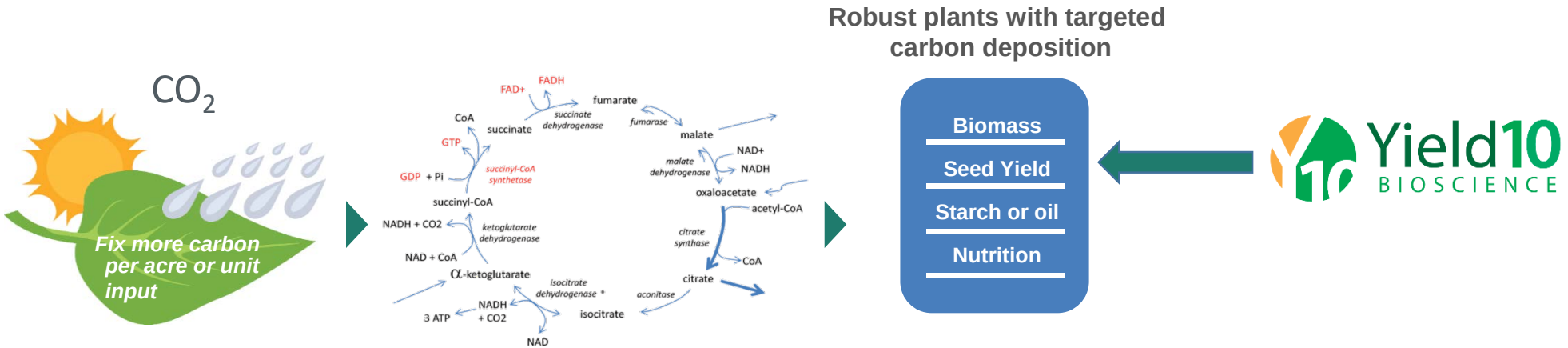
- Gene deletions using genome editing e.g. CRISPR/Cas9 to delete native gene function
- Introduction of genes from closely related or same species with **no foreign DNA**

[1] D.K. Ray, et. al PLOS, 2013
[2] https://www.aphis.usda.gov/aphis/ourfocus/biotechnology/sa_brs_vpm/340-peis

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) Optimizing the flow of fixed carbon to seed (grain)



Enhanced Carbon Capture Photosynthesis (Source)

Plant Central Metabolism

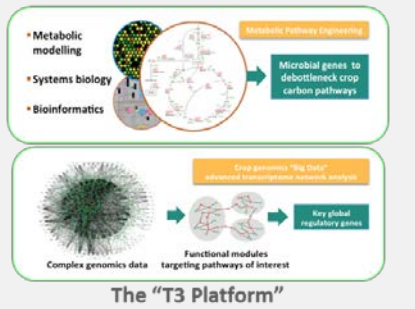
Carbon fixed in products (Sink)

Build Better Plants to Address Food Production

Technology Platforms

Yield10 applies its technology platforms to enable step-change increases in crop yield

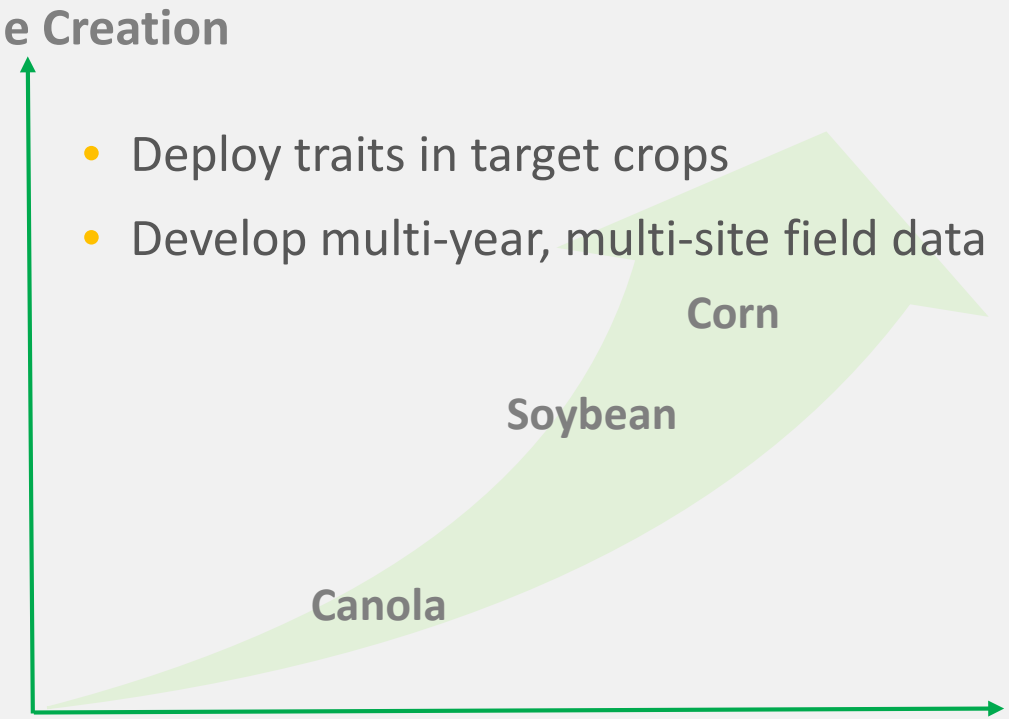
Leveraging microbial diversity to debottleneck plant carbon metabolism
"Smart Carbon Grid for Crops"



The "T3 Platform"

"Big data" mining to identify powerful global regulator genes

- "Fast Field Testing" in Camelina
  - Validate performance in field
  - Identify any negative effects
  - Identify downstream bottlenecks
  - Optimize gene expression and additional gene modifications to maximize yield outcomes



Trait Gene Discovery
2012-2016

Translation
Ongoing 2016

Value Demonstration
Started 2017

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Trait Genes in Development

Yield10 has a rich pipeline of crop traits and many opportunities exist for licensing and/or partnerships

	Trait	Value Driver	Genetic Engineering	Genome Editing	Current Activity Next Steps	Licensing/Partnering Opportunities
Smart Grid	C3003 (1st & 2nd Gen)	Seed yield Water use	+	-	Camelina field testing Canola, soybean and rice in development	alfalfa, cotton, potato, rice, wheat, sugar beet and potentially corn
Smart Grid	C3004	Seed yield	+	+	Camelina, canola editing underway	cotton, potato, rice, wheat, sugar beet and potentially corn
Smart Grid	C3007	Oil content	+	+	Camelina, canola editing underway	Camelina, canola, soybean
T3 Platform	C4001	Yield	+	+/-	Corn transformation	Forage, all major crops
T3 Platform	C4002	Yield	+	+/-	Corn transformation	Forage, all major crops
T3 Platform	C4003	Yield	+	+/-	Rice transformation Corn transformation	All major crops
T3 Platform	C4004	Yield	+	+	Corn transformation	All major crops
T3 Platform	C4005	Drought	+	+/-	Corn transformation	All major crops
T3 Platform	C4006	Drought	+	+/-	Corn transformation	All major crops

22 additional targets for genome editing have been identified and will undergo validation

Yield10: Trait Gene Selection Criteria

Yield10 has a rich pipeline of yield gene trait leads but must be selective in those we choose to pursue on our own

- Does the gene trait bring new science to a known yield limitation problem?
  - Do we understand the biological mechanism?
  - Is it differentiated and do we believe we have a solid IP position?
- Acreage potential and hence revenue potential
  - Effective in all varieties for a major crop (in e.g. all soybean varieties)
  - Can it be used to enhance yield in a number of different crops?
  - Could it become a franchise trait similar to Roundup® Ready or YieldGard®?
- Do we have access to capabilities with a clear path to develop field trial data?
- Assessment of economic potential based on results achieved in our studies
- Is the gene trait amenable to genome editing, i.e. lower cost and regulatory barriers to entry?
  - Deploy in crops currently not GMO
  - Can this be leveraged for near term licensing/partnerships for revenue to support longer term goals

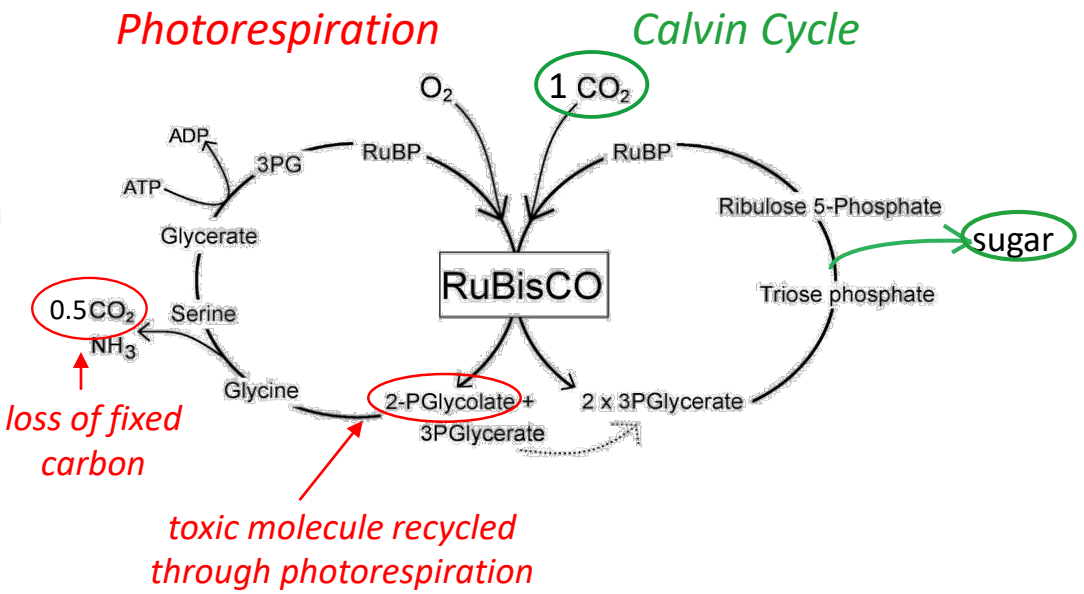
Photorespiration: A Well Known Limit to Yield in C3 plants

C3003 yield gene trait impacts photorespiration, improving efficiency of photosynthesis

- Many key food crops rely on C3 photosynthesis
  - Canola, soybean, rice, wheat, potato, and others
- Calvin cycle of photosynthesis, key enzyme RuBisCo fixes carbon dioxide producing sugar for plant growth
- C3 crops have considerable yield loss due to photorespiration, a side reaction leading to significant fixed carbon and energy loss
- Models suggest that photosynthesis could improve by 12-55% in the absence of photorespiration
- A 5% reduction of photorespiration in soybean and wheat would add ~$500 million/year of economic value in the US

(Walker et al., 2016, Ann. Rev. Plant Biol. 67:17.1 – 17.23)

C3 photosynthesis reactions



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Highlights of Camelina Field Test – C3003

Selected Findings from 2016 Camelina Fast Field Test of C3003 Trait

	C3003 Study Findings
Avg Seed Yield *(lbs/hectare)*	Line NJ01 23%* yield increase vs. control Line NJ02 5% yield increase vs. control
Avg Maturity	Avg 6 days* earlier
Avg Seed Weight *(mass of 100 seeds)*	Line NJ01 17%* decrease vs. control Line NJ02 19%* decrease vs. control
Seed Oil Content *(% of seed weight)*	No significant change

*Data is average of 5 plots * Statistically significant, P<0.05*
Molecular analysis of representative plant samples from the trial are ongoing
C3003 is licensed from University of Massachusetts pursuant to an exclusive license agreement.

Key positive outcomes

- C3003 expressed in Camelina produced up to a 23% increase in average seed yield in the best line
- Accelerating development in canola, soybean and rice

Additional studies

- Second generation C3003 produced up to a 24% increase in seed yield in greenhouse while maintaining seed weight

Spring 2017 field tests

- Plan to test second generation C3003 in Camelina and first generation C3003 in canola; planting Q2, results Q4

C3003 Trait Development Timeline

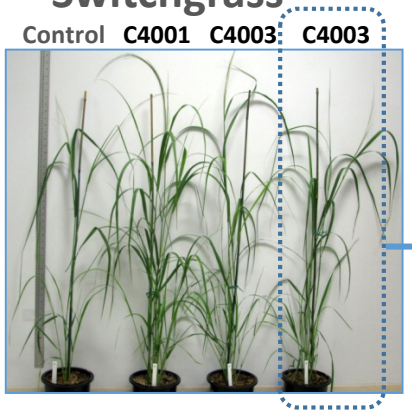
Indicative Proof Point Timelines for C3003

	Crop/Trait	Year			
		2017	2018	2019	2020
Translation	Camelina/Gen 1 C3003	✓ Field test data (Q1)			
	Camelina/Gen 2 C3003	✓ Greenhouse data (Q1) Field test data (Q4)*			
	Camelina/Gen 3 C3003		Field test data (Q4)		
Value Demonstration	Canola/Gen 1 C3003	Greenhouse data (Q2) Field test data (Q4)*	Field trial data (Q4)	Field trial	
	Canola/Gen 2 C3003			Field trial	
	Canola/Gen 3 C3003				
	Soybean/Gen 1 C3003	Greenhouse data (Q4 2017/Q1 2018)		Field test	Field trial
	Soybean/Gen 2 C3003	Greenhouse data (Q4 2017/Q1 2018)		Field test	Field Trial
	Rice/Gen 1 C3003	Greenhouse data (TBD)			

* Progress depends on results achieved in greenhouse studies

Plant Regulator Genes Impacted by C4003 – Editing Targets

Switchgrass



C4003 increases photosynthesis and biomass by 40% over the control

Effect on downstream regulator genes

Activity increased for 32 genes

Activity reduced for 16 genes

Test increased activity of C4004 in switchgrass

The C4004 trait gene is a negative controller of plant growth and a good target for genome editing

Initiate editing of the equivalent gene in forage crops

Rice (in progress)

Impact of Increased activity of C4003 a global regulator gene in rice?

Determine the effect of C4004 on photosynthesis, seed yield and downstream regulator genes

Identify negative regulators as targets for genome editing

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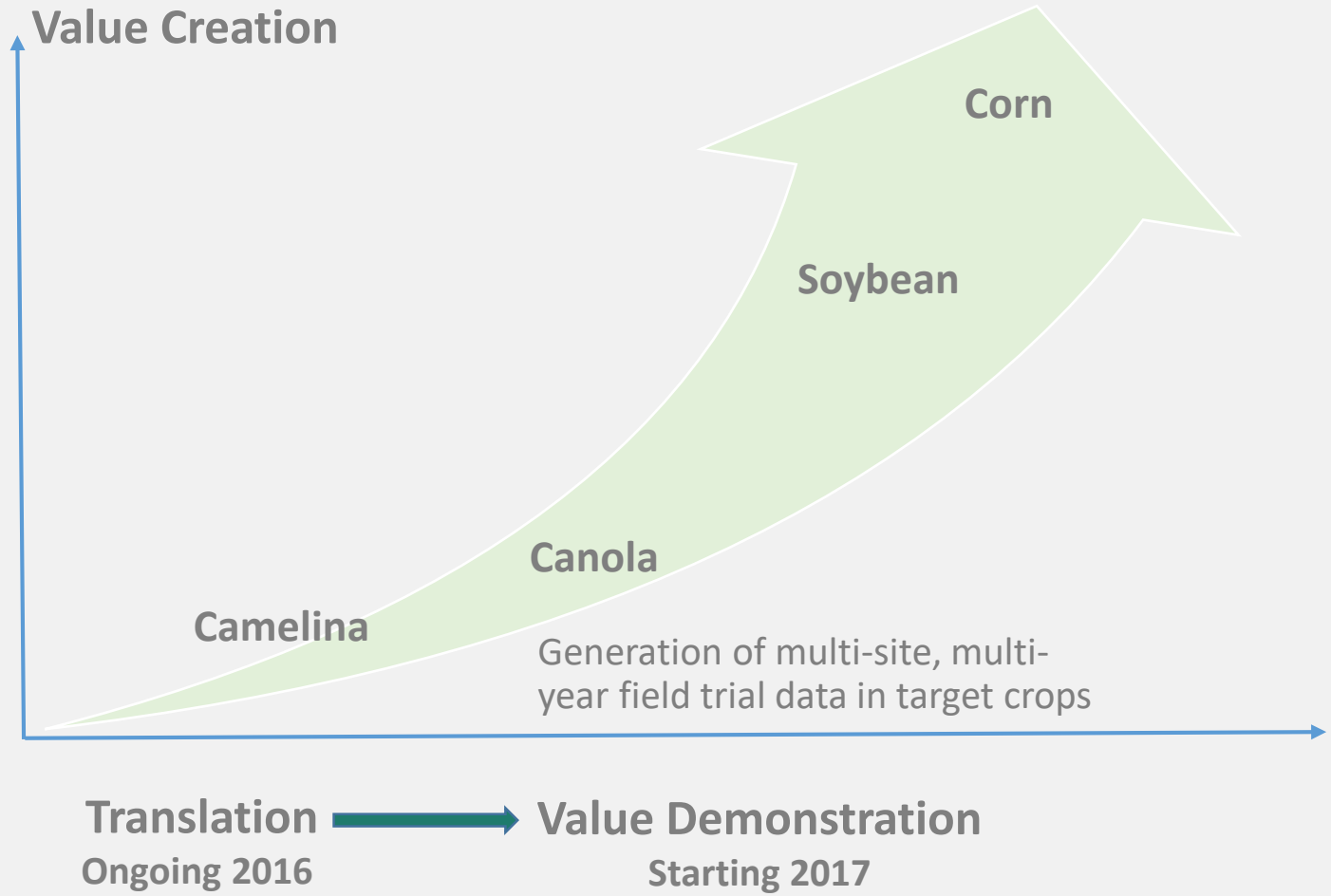
Value Creation

Yield10's technology platforms enable value creation through step-change increases in crop yield

Crop	2016 Harvest Tonnes/ Bushels	2016 Value in Billions	Total Annual Value Potential	
			Target Yield Increase	Annual Value in Billions
Canola[1] (Can)	18.4 M tns	$9.6	20%	$1.92 B
Soybean[2] (US)	4.36 B bu	$40.11	20%	$8.01 B
Corn[2] (US)	15.2 B bu	$50.16	10%	$5.16 B

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



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Upcoming Milestones

Yield10 is working to progress our yield enhancement technologies and build collaborations

- Report on progress on C3003 with additional constructs and crops
  - Q2 Report greenhouse data from 1st generation C3003 trait in canola
  - Q4 Report field test data from 2nd generation C3003 trait in Camelina and 1st generation C3003 trait in canola
  - Report greenhouse data from 1st generation C3003 trait in rice (tbd)
  - Q4, 2017 - Q1, 2018 Report greenhouse data from 1st and 2nd generation C3003 traits in soybean
- Continue to deploy additional technology innovations in Camelina, canola, soybean and corn lines
  - Progress C4000 series traits from the T3 discovery platform into corn and rice
    - Report greenhouse data for C4003 in rice in Q4, 2017 – Q1, 2018
  - Progress the CRISPR/Cas9 genome editing program focused on Yield10's proprietary targets
  - Secure Ag industry collaborations and additional grants
  - Continue to leverage academic collaborations to access breakthrough crop science
  - Continue to build intellectual property portfolio
  - Publication of technical papers on key technologies

Investment Considerations

Breakthrough technology for improved crop yield

- Novel yield trait technologies for both C3 and C4 photosynthetic crops
- Foundation IP in place (owned/in-licensed)
- Positive results achieved for the C3003 yield trait gene
- Additional gene editing targets identified for future studies

Organization is structured to achieve upcoming milestones

- Experienced management team with strong track record
- Staff and research facilities in place

Aligned with compelling megatrends

- Global population growth from 7 billion to over 9.6 billion by 2050 driving need for >70% increase in food production over the same period
- Growing pressure on water and land resources, issues with intensive agriculture

Large addressable market opportunity

Crop R&D $4 billion Total Seed $53 billion Global food $4 trillion

Numerous opportunities for value capture

- Licensing and/or funded development projects with strategic partners
- Sale or acquisition of assets

Contacts

To learn more about Yield 10 Bioscience, please visit www.yield10bio.com

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