Yield10 Bioscience, Inc.

(NASDAQCM:YTEN)

Investor Presentation

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

August 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

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
- More than 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

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 prosperity and population growth creates reliable long-term demand for ag-innovation
- Need ~70% increase in food production by 2050
- Growing pressure on water and land resources, issues with intensive agriculture
- Traditional breeding cannot solve this problem[1]

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

UNITED NATIONS

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

Ag Sector… consolidation

- Emerging top 3 Ag majors significant need to fill product development pipelines

Unmet Need…Innovation and new technology approaches

- Approaches the problem via a technology approach/knowledge base that has been historically productive at a time when a critical new tool, genome editing, is available

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

Opportunity…targeting $15 billion of incremental annual recurring value creation in North American crops

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

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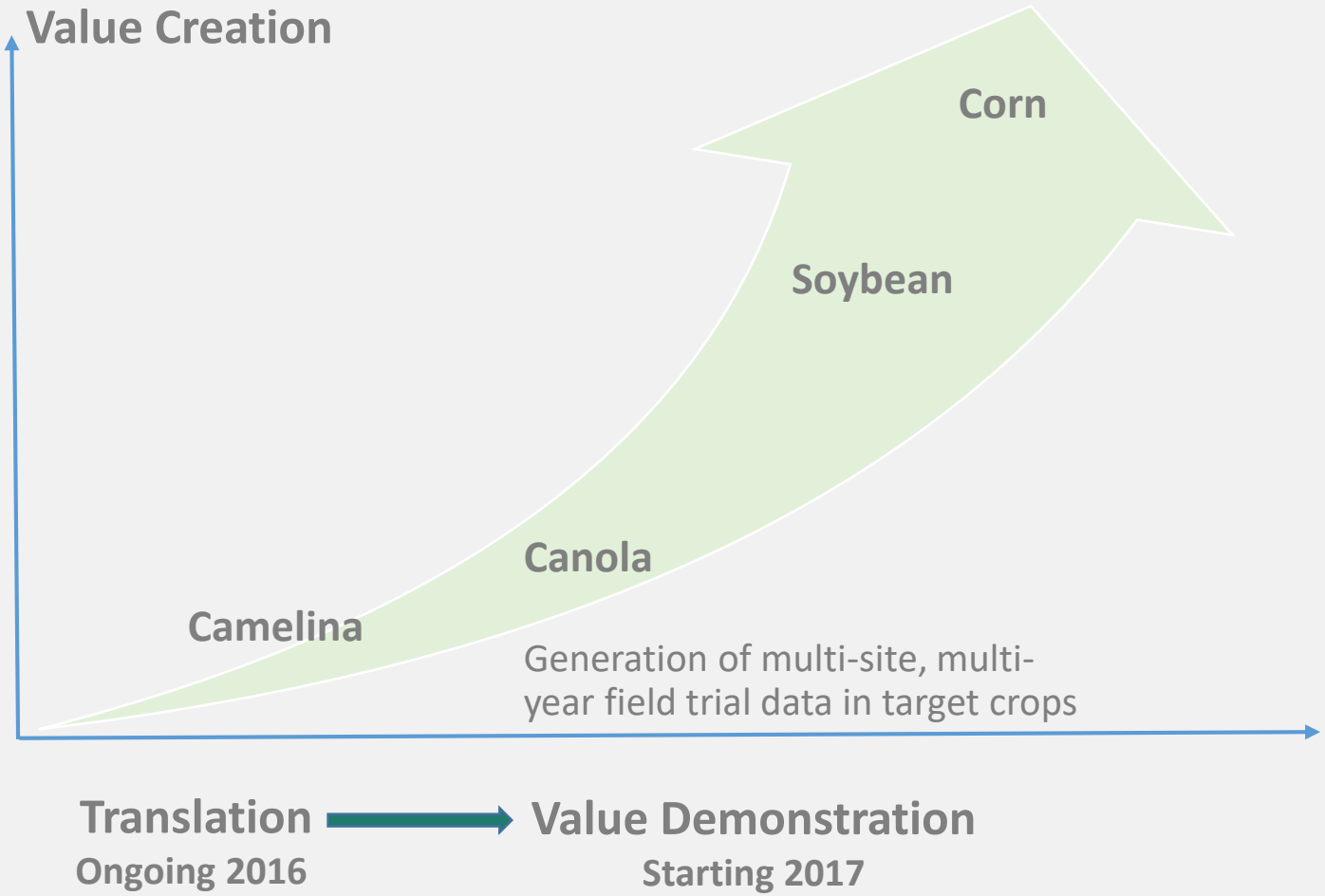
Value Creation

Yield10's gene traits may 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 Potential 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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Yield10 Business Strategy

Building and Capturing Value from Yield10 Technologies

- Recognize our role as a trait provider to the seed sector
- Participate in the AG industry value sharing model
  - Historically ~50% of value to farmer and ~50% shared among seed company and trait innovator
- Discover traits in model crops using our unique capabilities and discovery platforms
- Leverage Fast Field Testing in Camelina to guide further development and testing
- Rapidly progress interesting traits into major food crops
  - Establish key proof points and de-risk using multi-site field trials
- Develop options to build and capture value
  - Access non-dilutive funding from government and NGO grants
  - Ag industry partnerships/licensing individual traits in specified crops
  - M&A
- Continue to build the intellectual property portfolio around Yield10 innovations

Recent Accomplishments

- ✓ Started C3003 Field Test for C3003 in Camelina and canola
- ✓ Submitted an “Am I regulated?” letter to USDA-APHIS for genome-edited Camelina
- ✓ Reported results showing that trait C4001 produces significant increases in plant yield
- ✓ Signed a research collaboration with NRC to improve yield and drought tolerance in wheat
- ✓ Filed 4 patent applications
- ✓ Regained compliance with NASDAQ minimum bid price rule
- ✓ Raised $2.0M, net in offering of common stock and warrants

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?
- Acreage and revenue potential
  - Effective in all varieties of multiple crops >> > a franchise trait similar to Roundup® Ready or YieldGard®?
- Do we have access to the technical 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, leverage for near term licensing/partnerships for to support longer term goals

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
Smart Grid	C3003 (1st & 2nd Gen)	Seed yield Water use	+	-	Camelina 1st & 2nd Gen in field testing Canola 1st Gen in field testing Soybean and rice in development
Smart Grid	C3004	Seed yield	+	+	Camelina editing underway
Smart Grid	C3007	Oil content	+	+	Camelina, canola editing underway
T3 Platform	C4001	Yield	+	+/-	Wheat program underway Corn transformation next step
T3 Platform	C4002	Yield	+	+/-	Corn transformation next step
T3 Platform	C4003	Yield	+	+/-	Wheat program underway Rice transformation underway Corn transformation next step
T3 Platform	C4004	Yield	+	+	Wheat program next step Corn transformation next step
T3 Platform	C4005	Drought	+	+/-	Corn transformation next step
T3 Platform	C4006	Drought	+	+/-	Corn transformation next step

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

Novel Yield Trait Gene: C3003

Advancing Development of C3003 in Key Oilseed Crops and Rice

2017 field tests of C3003 underway

- Testing 1st & 2nd generation C3003 in Camelina
- Testing 1st generation C3003 in canola
- Study results on seed yield due in Q4 2017
- Additional longer lead data, e.g. oil composition and molecular analysis, will follow

Prior data for C3003 in Camelina

- 1st generation, up to 23% seed yield increase in 2016 field test
- 2nd generation, up to a 24% increase in seed yield (greenhouse)

Metabolic models provide new insights on mechanism

- Two new patent applications filed

Translating the C3003 trait to other C3 Crops

- Q4, 17-Q1,18, data for 1st and 2nd generation C3003 in soybean
- Early 2018, data for C3003 in rice

C3003 Camelina field test Aug. 2017

C3003 canola field test Aug. 2017

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)	Field trial		
	Camelina/Gen 3 C3003		TBD*		
Value Demonstration	Canola/Gen 1 C3003	Field test data (Q4)	Field trial data (Q4)	Field trial	
	Canola/Gen 2 C3003	Greenhouse data (Q4-Q1)	Field test data (Q4)*	Field trial	
	Canola/Gen 3 C3003				
	Soybean/Gen 1 C3003	Greenhouse data (Q4 2017/Q1 2018)	TBD [1]	Field test	Field trial
	Soybean /Gen 2 C3003	Greenhouse data (Q4 2017/Q1 2018)	TBD [1]	Field test	Field Trial
	Rice / Gen 1 C3003		Greenhouse data (2018)	TBD [1]	

* Progress depends on results achieved in greenhouse studies

[1] Progress depends on seed bulk up in greenhouse

The Potential for Genome Editing in Agriculture

Potential to Develop Advanced Crop Traits using Genetic Engineering having "Nonregulated Status"

- Achieving "deregulated" status for traditional biotech traits is time consuming and expensive
- Genome editing techniques (eg. CRISPR) to reduce the activity or inactivate gene targets in a plants
- Genome edited plants may be unregulated thereby reducing product development timelines and costs[1]

Yield10 identifies gene combinations for editing to achieve increased crop performance

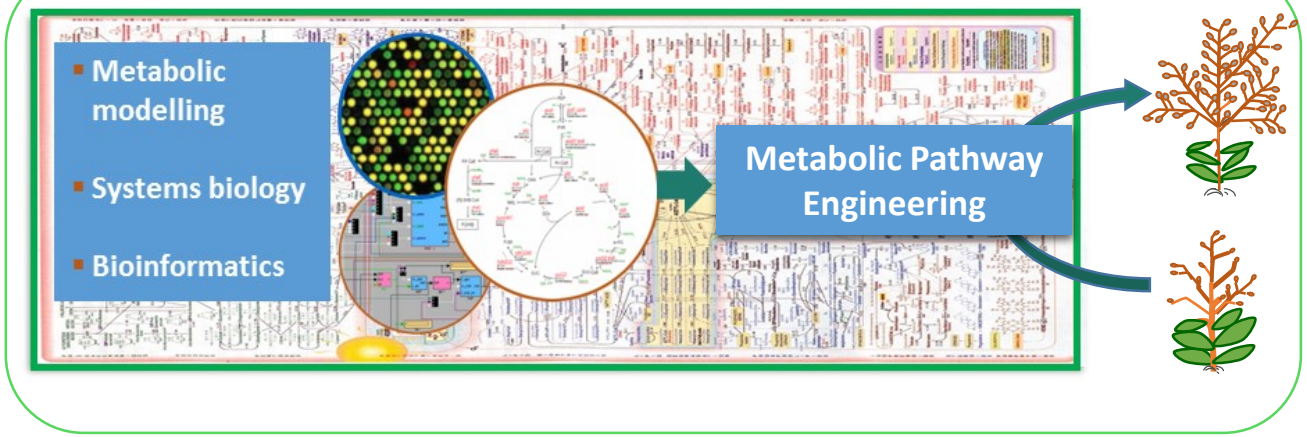
- Our genome editing targets include metabolic gene targets C3004, C3007 and C3008 and the 22 downstream transcription factors we have shown to be down regulated in high yield transgenic plants
- Expand traits developed using genetic engineering tools into a wider range of crop species
- Submitted "Am I Regulated?" letter to USDA-APHIS for genome edited Camelina

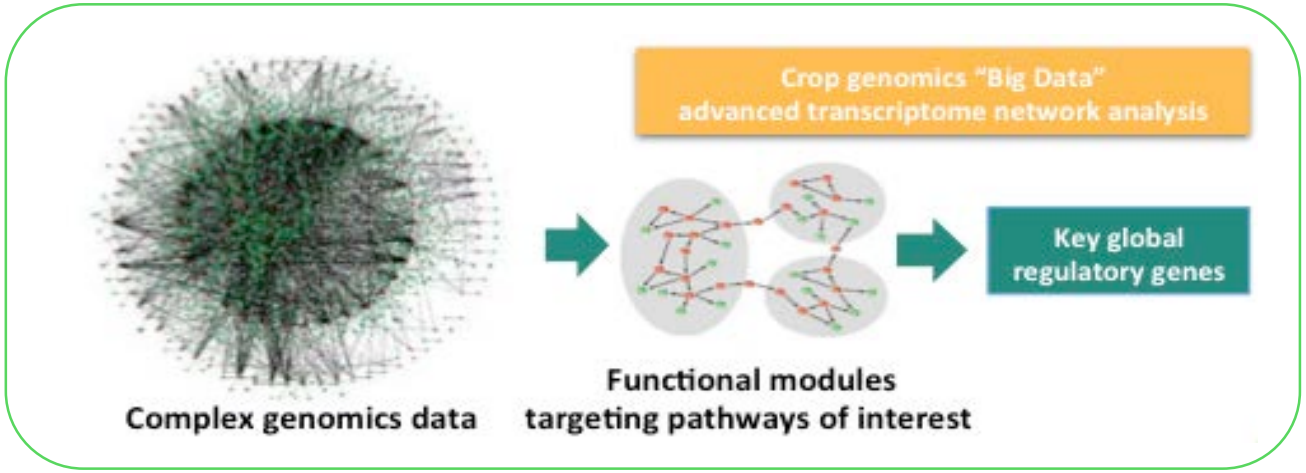
WSJ Next Phase of High-Tech Crops, Editing Their Genes
May 7, 2017 By Jacob Bunge

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

Yield10 Technology Platform Overview

Discovery paradigm based on metabolic pathway engineering expertise, enables the intelligent targeted manipulation of specific gene combinations





The "Smart Carbon Grid for Crops"

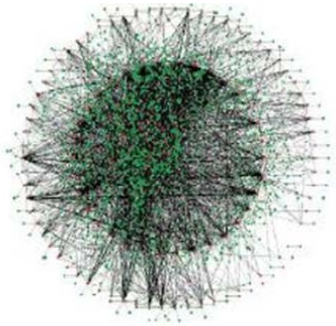
- Metabolic engineering platform to improve carbon capture and conversion efficiency to seed
- Leverages large historical investment in advanced metabolic engineering
- Uses microbial diversity to eliminate bottlenecks in plant carbon metabolism

The "T3 Platform"

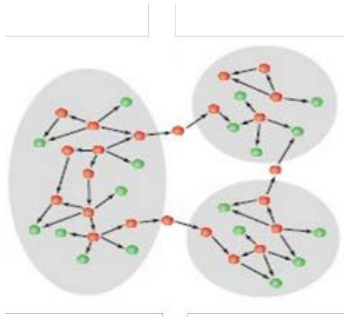
- Advanced transcriptome network analysis
- Identify global regulator genes to achieve step-change improvements in crop yield
- Identify gene editing targets with potential to achieve step-change improvements in crop yield

Global Regulatory Genes to Increase Biomass Yield

Used transcriptome-based regulatory association networks to identify candidate regulatory genes predicted to increase photosynthesis and biomass yield



Complex transcriptomics data



Gene interaction network

Functional modules target pathways of interest – increased photosynthesis and biomass production

Global regulatory gene candidates identified

(C4001, C4002, C4003)

Generated transgenic plants to characterize candidate genes

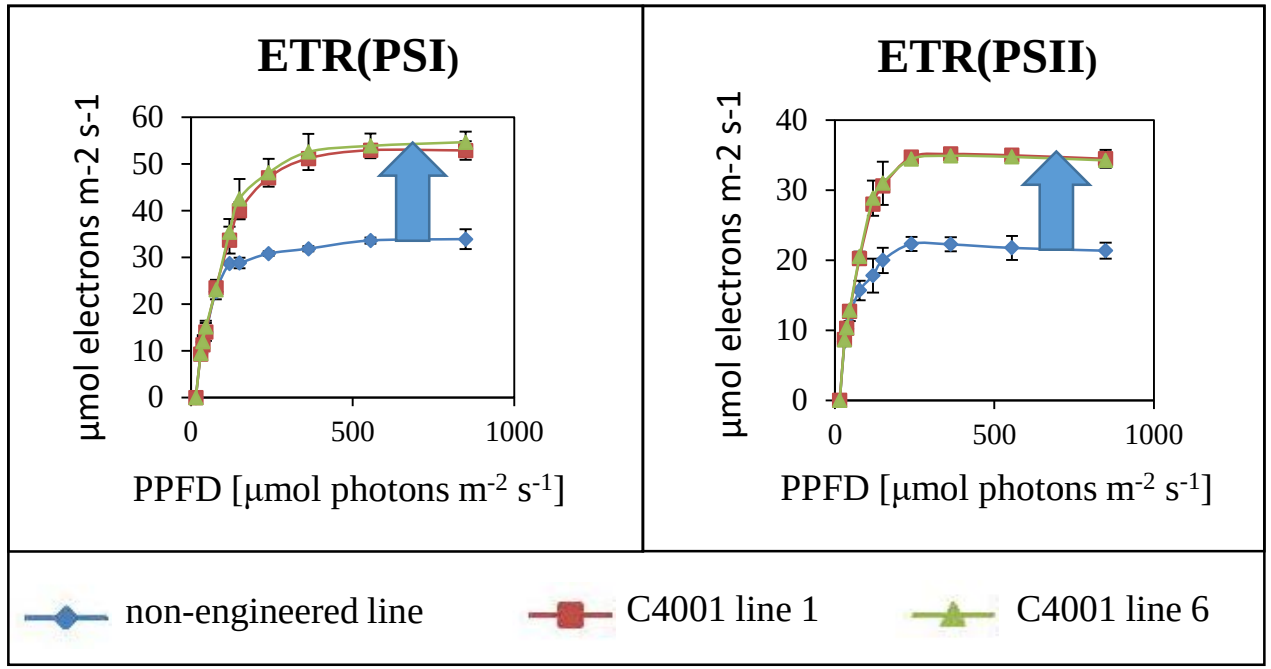
- Transformed switchgrass with C4001 gene
- Transgenic line analysis to pick best candidate lines for further characterization
- Presented data for C4001 at The ASPB Plant Biology 2017 Meeting and 2017 Gordon Research Conference in Plant Metabolic Engineering

Plant Metabolic Engineering
Gordon Research Conference

Measurement of Photosynthetic Parameters for C4001

Key photosynthetic parameters increased in C4001 plants

- Multiple photosynthetic parameters measured
- Results: Observed up to a 75% increase in electron transport rate (ETR) per unit leaf area around photosystem I and II



Increase due to C4001 Overexpression (increased activity)

Abbreviations:

ETR, electron transport rate
PPFD, photosynthetic photon flux density
PSI, photosystem I
PSII, photosystem II

Regrowth of C4001 Lines

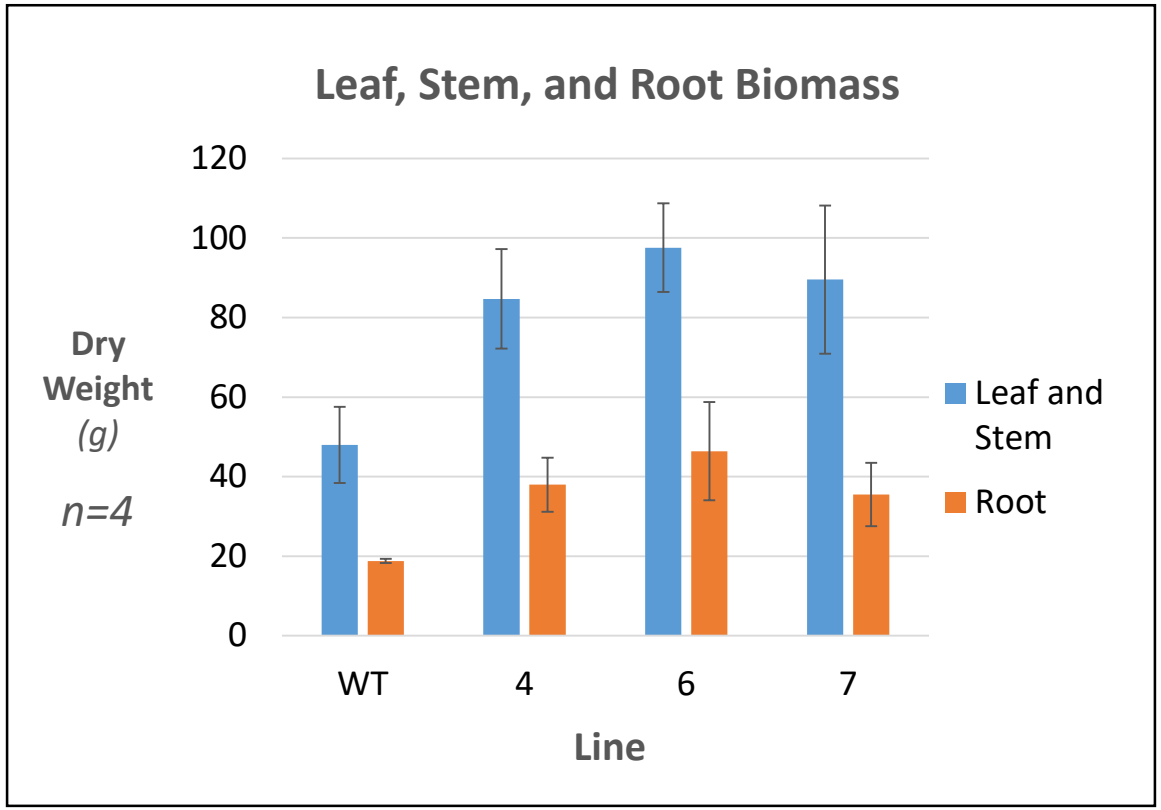
- 4 plants from each line were grown in greenhouse
- Dry weight of biomass and roots measured
- Results: 75-100% increase in leaf and stem biomass; 85-145% increase in root mass

Leaves & stems

CONTROL 4d 6e 7e

Roots

CONTROL 4d 6e 7e



Plants 4d, 6e, and 7e are C4001 engineered lines
Plants grown in a greenhouse for 5 months

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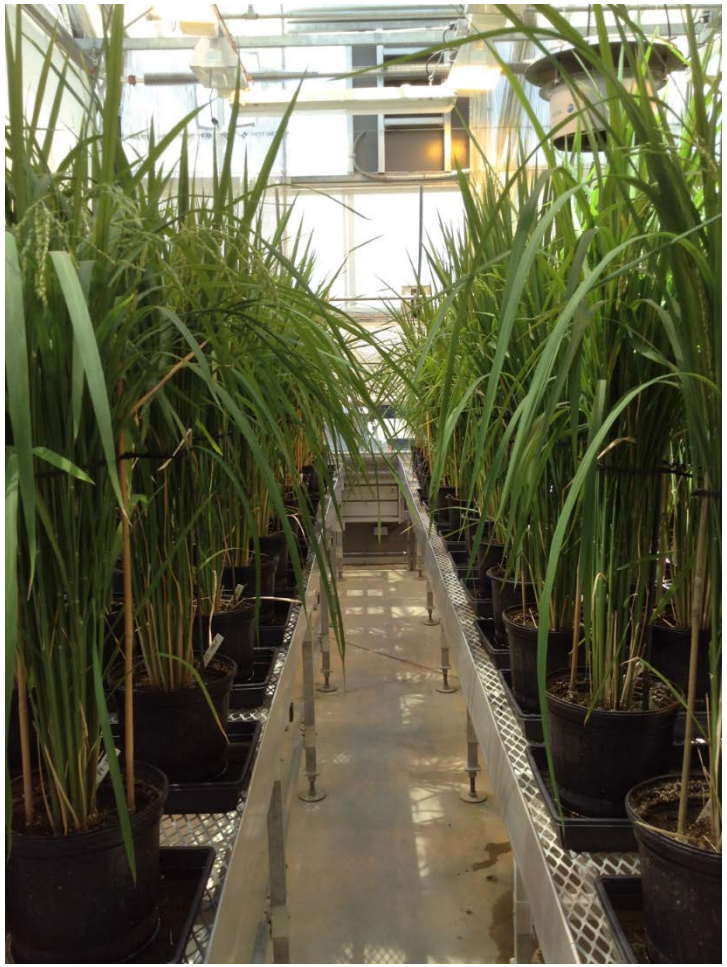
Evaluation of C4001 in Key Crops: Rice

- C4001 genes are present in major crops (e.g. corn, rice, wheat)
- Transformed rice with C4001 gene from switchgrass and rice
- 1st generation plants are growing in greenhouse
- Working towards producing 3rd generation plants that will enable us to quantitate seed yield



Switchgrass
C4001 in rice

Rice
C4001 in rice

Signed Collaboration for New Wheat Traits

- Signed two-year collaboration with The National Research Council of Canada to identify new traits to improve yield and drought tolerance in North American wheat
- Collaboration is with Yield10's wholly owned Canadian subsidiary, Metabolix Oilseeds
- Yield10 and Metabolix Oilseeds will provide access to proprietary C4000 series of traits including global transcription factors (GTFs)
- Work with C4000 series of traits may enable the development of higher yielding wheat and/or wheat with drought tolerance
- The National Research Council of Canada is contributing financial resources and expertise in wheat research and breeding
- Yield10 retains rights to IP

Upcoming Milestones

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

- Report on progress on C3003 with additional constructs and crops
  - Q4 Report field test data from 2nd generation C3003 trait in Camelina
  - Q4 Report field test data from 1st generation C3003 trait in canola
  - Q4, 2017 - Q1, 2018 Report greenhouse data from 1st and 2nd generation C3003 traits in soybean
  - Report greenhouse data from 1st generation C3003 trait in rice in 2018
- Progress C4000 series traits from the T3 discovery platform into rice and corn
  - Report greenhouse data for C4003 in rice in 2018
  - Begin work on C4000 series traits in corn H2, 2017
- Progress CRISPR genome editing program focused on Yield10's proprietary targets
  - C3004, C3007 and C3008 for increased seed yield and seed oil content, 22 downstream transcription factors form the T3 Platform
- Secure non-dilutive sources of funding and Ag industry collaborations
- Leverage our academic collaborations to access breakthrough crop science
- Build our intellectual property portfolio
- Communicate our scientific innovations in technical presentations and papers

Investment Considerations

Yield10 designs precise alterations to gene activity and the flow of carbon in 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 a new arena

- More than 10 recent patent applications for increased crop yield

Approaches the problem via a technology approach/knowledge base that has been historically productive at a time when a critical new tool, genome editing, is available

Has significant, near-term milestones in major row crops

- Canola (field trials Q4 2017) and soybean (greenhouse data Q4 2017, Q1 2018)

Has numerous opportunities for value capture

Has an organization structured to achieve upcoming milestones