



**Yield10**  
B I O S C I E N C E

Yield10 Bioscience Inc.  
(NASDAQ:YTEN) – Investor Presentation

Highlights of 2016 Camelina Field Tests for the C3003 Gene Trait

**January 26, 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 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 Quarterly Report on Form 10-Q for the quarter ended September 30, 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 working to produce step-change improvements in crop yield to enhance global food security

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

## Yield10 is bringing the extensive expertise and track record of Metabolix in optimizing the flow of carbon in living systems to the agriculture sector with a focus on increasing yield in key row crops

- 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

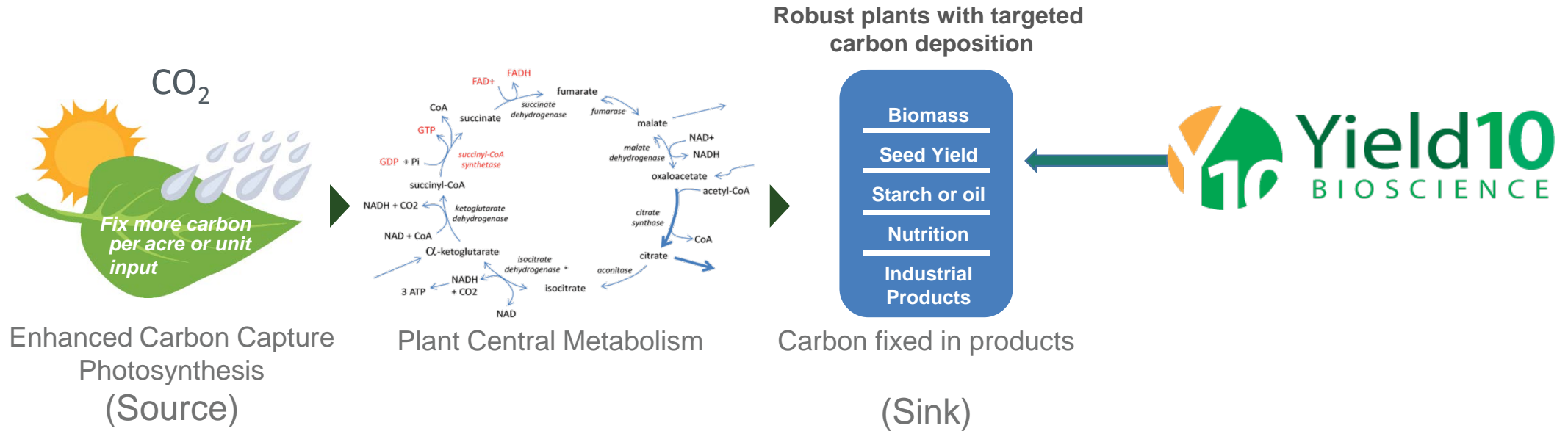
## “Step-change improvements” - Yield10 is targeting >10 bushel/acre increases in our key row crop targets

- This is a very challenging goal, today we will present a technical update on progress from field testing of our lead trait C3003



## 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



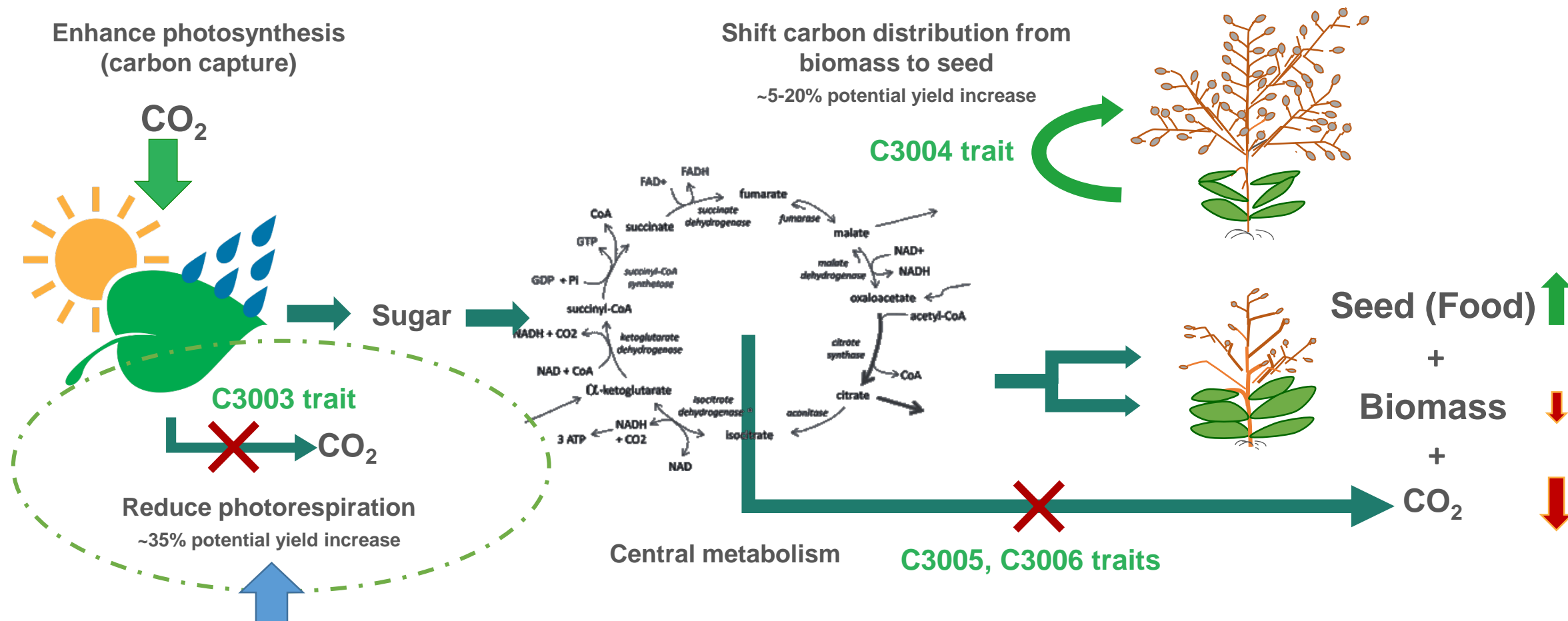
**“Enhanced Carbon Capture >>>> Targeted Carbon Deposition”**

The Yield10 technology platform leverages advanced metabolic engineering systems and proprietary transcriptome network analysis to enhance carbon capture and control metabolic pathways driving crop yield

# Smart Carbon Grid for Crops

## Innovative Approach to Increasing Seed Yield in C3 Crops

(vast majority of food consumed by humans, e.g., canola, soybean, rice, wheat and potato)



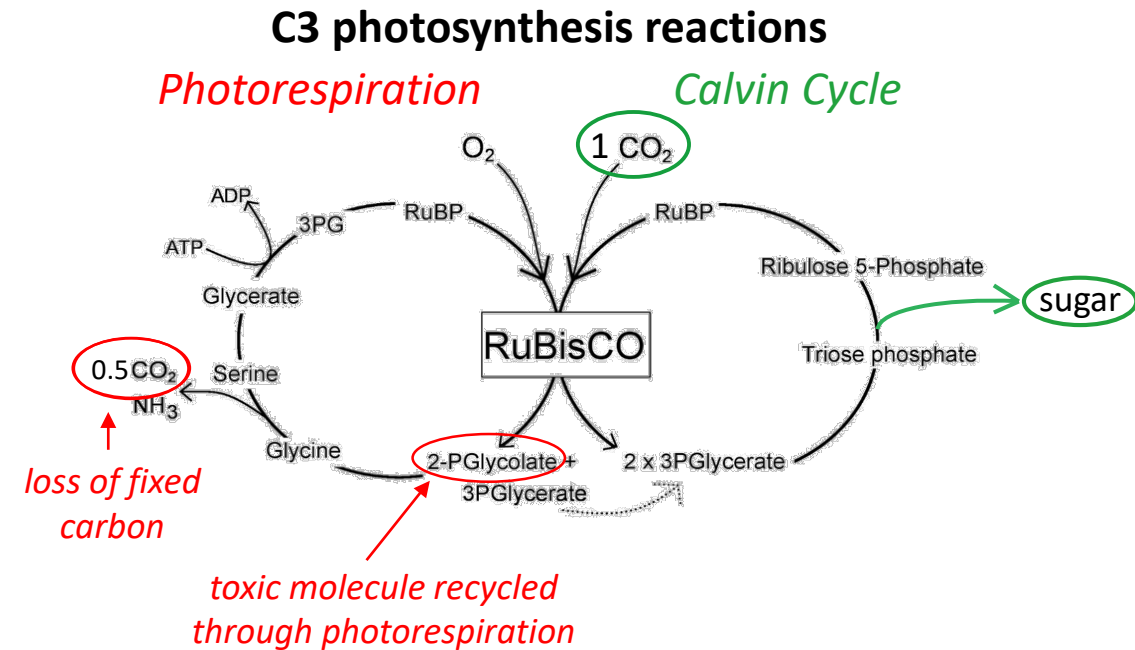
Focus of January 26 investor call

# Photorespiration: A Well Known Limit to Yield in C3 plants

## Photorespiration: A side reaction in crops having the C3 photosynthesis system

- Many key food crops rely on C3 photosynthesis
  - Rice, wheat, soybean, canola, potato, etc
- 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 competing wasteful cycle where RuBisCo fixes oxygen instead of carbon dioxide
  - produces a toxic compound that must be removed
  - leads 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 increase yields estimated to add ~\$500 million/year of economic value in the US

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



# Highlights of Camelina Field Test – C3003

## Selected Findings from 2016 Camelina Fast Field Test of C3003 Trait

	C3003 Study Findings
<b>Avg Seed Yield (lbs/hectare)</b>	Line NJ01 23%* yield increase vs. control Line NJ02 5% yield increase vs. control
<b>Avg Maturity</b>	Avg 6 days* earlier
<b>Avg Seed Weight (mass of 100 seeds)</b>	Line NJ01 17%* decrease vs. control Line NJ02 19%* decrease vs. control
<b>Seed Oil Content (% of seed weight)</b>	<b>No significant change</b> Line NJ01 34.8 +/- 0.6% Line NJ02 35.5 +/- 1.5% WT Line 34.1 +/- 0.9 %

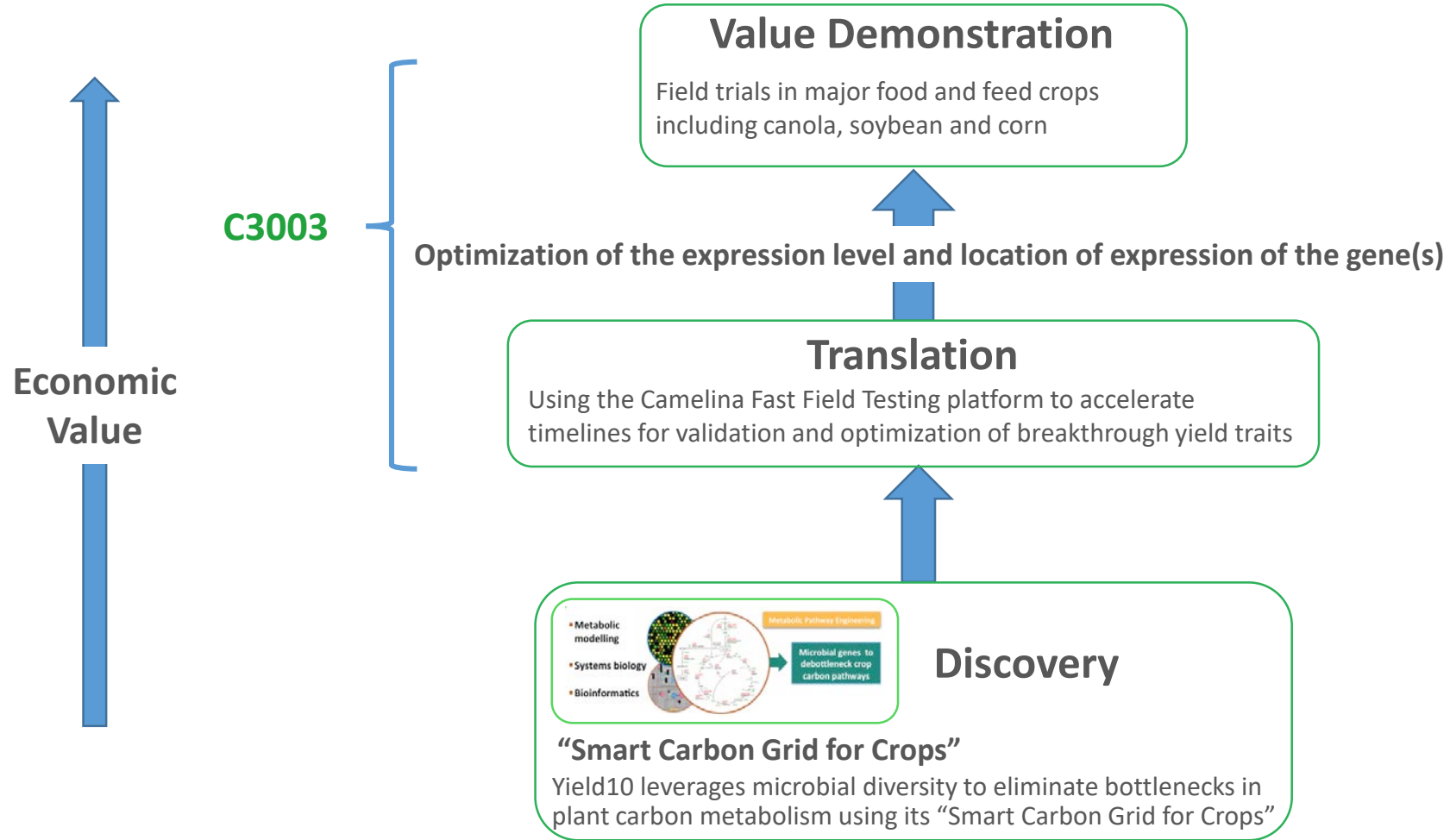
Data is average of 5 plots \* Statistically significant,  $P < 0.05$   
Molecular analysis of representative plant samples from the trial are ongoing

### Key positive outcomes:

- C3003 expressed in Camelina produced up to 23% increase in average seed yield in the best line, supporting rationale for accelerating development in canola, soybean and rice
- Plants matured on average 6 days earlier than controls, an agronomic benefit
- Expression of C3003 trait did not affect seed oil content

### Other observations:

- Seed size was decreased, we believe due to tissue-wide expression of C3003. Molecular analysis of greenhouse grown plant samples shows C3003 alters the function of plant genes (e.g. C3004) involved in carbon distribution networks
- Yield field trials are challenging and there is a lot of variability to manage





# C3003 Trait Development Timeline

## Indicative Proof Point Timelines for C3003

	Crop/Trait	Year			
		2017	2018	2019	2020
<b>Translation</b>	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)		
<b>Value Demonstration</b>	Canola/Gen 1 C3003	Greenhouse data (Q1/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

**Commercial value increases and risk decreases as we progress through field validation, with numerous options for value capture along the way**

## Yield10 is working to progress its yield enhancement technologies and build collaborations

- Report on progress on C3003 with additional constructs and crops
  - Q1 Report greenhouse data from 2<sup>nd</sup> generation C3003 trait in Camelina
  - Q1-Q2 Report greenhouse data from 1<sup>st</sup> generation C3003 trait in canola
  - Q4, 2017 - Q1, 2018 Report greenhouse data from 1<sup>st</sup> and/or 2<sup>nd</sup> generation C3003 traits in soybean
  - Report greenhouse data from 1<sup>st</sup> generation C3003 trait in rice (TBD)
- 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 (TBD)
  - Progress the CRISPR/Cas9 genome editing program focused on Yield10's proprietary targets
  - Continue to leverage academic collaborations to access breakthrough crop science
  - Publication of technical papers on key technologies
  - Secure Ag industry collaborations and additional grants
  - Continue to build intellectual property portfolio