# Yield10 Bioscience Inc.

(NASDAQCM:YTEN)

First Quarter 2017 Investor Presentation

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

**May 11, 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**

# Financial Results

- **Balance Sheet**
  - $4.9 M in unrestricted cash at end of first quarter
  - Expect cash on hand together with government grant revenue will support operations into Q4 2017
  - Estimate net cash usage in 2017 of approx. $7.5 to $8.0 million, including anticipated restructuring costs
- **Continuing Operations**
  - First Quarter 2017 net loss of $2.1 M or $0.07 per share
  - $1.1M in R&D, $1.3M in G&A spend, $0.3M in grant revenue

# Recent Accomplishments

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

# 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 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

# Novel Yield Trait Gene: C3003

## Advancing Development of C3003 in Key Oilseed Crops and Rice

### Background on C3003

- The algal gene C3003 enables more efficient carbon capture through photosynthesis and step-change increase in seed yield
  - First generation C3003 produced up to a 23% increase in average seed yield in the best performing Camelina lines (2016 field test)
  - Second generation C3003 produced up to a 24% increase in seed yield while maintaining seed weight (2016 greenhouse study)

### Spring 2017 Field Tests of C3003 Starting Q2

- Testing 2nd generation C3003 in Camelina
- Testing 1st generation C3003 in canola
- Study results due in Q4 2017

### Translating the C3003 Trait to Additional C3 Crops

- Work underway to insert C3003 trait into soybean and rice

**CFIA approves camelina oil for use in Atlantic salmon feed by Aquafeed.com on 05/04/2017**

The Canadian Food Inspection Agency (CFIA) has approved the use of mechanically-extracted camelina oil as a feed ingredient for farmed salmon and trout.

Camelina sativa, or false flax, is a hardy oilseed plant that is rich in omega-3 fatty acids, protein and antioxidants. This super-nutritious plant is used as a vegetable oil for human consumption and as an ingredient or supplement in some animal feeds. Fish feed manufacturers have also explored the use of crop-based oilseeds like camelina as viable and cost-efficient substitutes for wild-sourced fish oils and proteins currently used in fish feeds.

# 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)<br>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<br>(Q4 2017/Q1 2018) | TBD [1] | Field test | Field trial |
| | Soybean /Gen 2 C3003 | Greenhouse data<br>(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 "Unregulated Status"

- Achieving "deregulated" status for traditional biotech traits is time consuming and expensive
- Genome editing techniques such as CRISPR/Cas9 allow us to reduce the activity or inactivate gene targets in a plant without adding new DNA sequences
- USDA-APHIS has indicated that genome edited plants may be unregulated
  - Achieve "unregulated" status for field research and field tests
  - Achieve "unregulated" status for commercial launch based on data from field tests
- Examples of genome editing targets include key limiting steps in a pathway to produce a product such as oil or negative regulators (transcription factors) of plant growth and stress tolerance
- Genome editing reduces product development timelines and regulatory costs
- Potential to expand traits developed using genetic engineering tools into a wider range of crop species

WSJ

Next Phase of High-Tech Crops, Editing Their Genes

May 7, 2017

By Jacob Bunge

## C3004 and C3007 Provide Genome Editing Targets in Key Oilseed Crops

### Background on C3004 and C3007

- C3004 is involved in controlling the flow of fixed carbon from leaves to seed providing an editing target that may increase seed yield and/or seed size
- C3007 is a negative controller in a key limiting step in seed oil production (option from Univ. of Missouri to license)
- C3004 and C3007 could be used separately or eventually stacked with C3003 line to produce high yield, high oil content Camelina, canola and soybean lines

### Potential Unregulated Traits

- Genome deletions of C3004 and/or C3007 in Camelina, canola and soybean with no foreign DNA
- Potential to “stack” with existing off-patent deregulated traits eg. Round-up Ready®

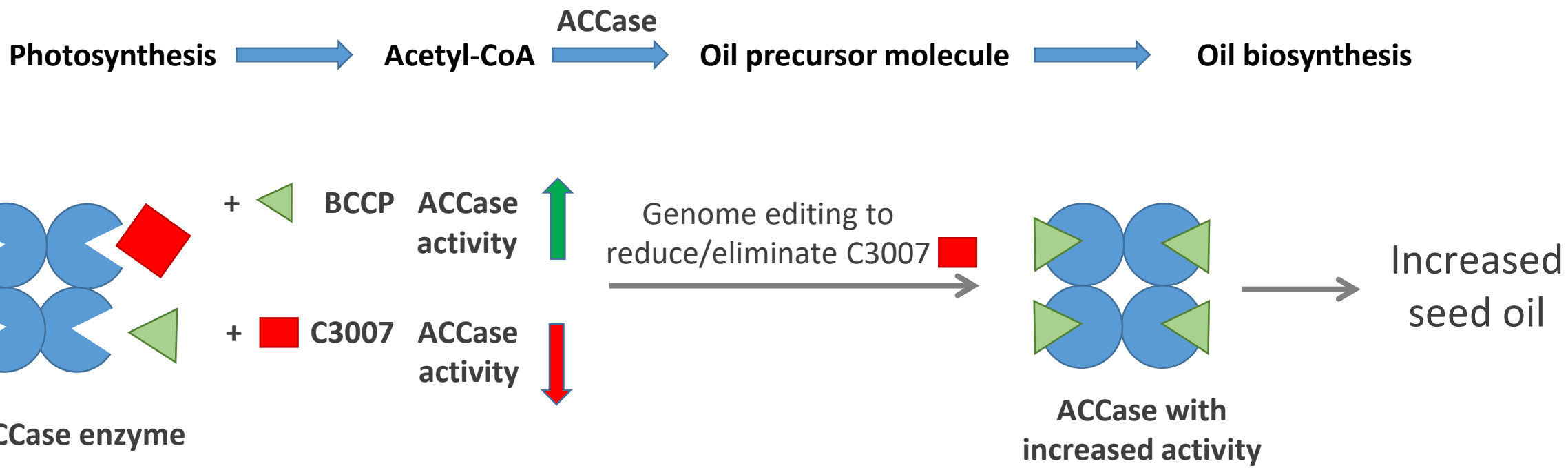
### Recent Progress

- Work underway to edit C3004 in Camelina
- Work underway to edit C3007 in Camelina and canola
- Preparing letter for USDA-APHIS for edited C3008 Camelina lines already developed in DOE project

# Increasing Oil Content through Genome Editing

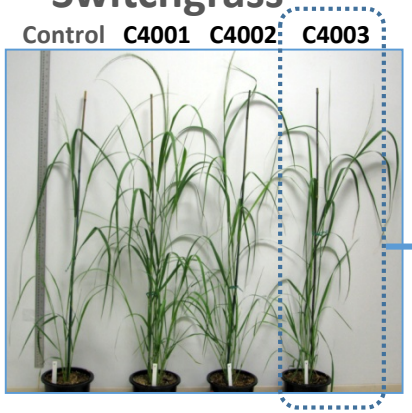
## Editing of C3007 trait

- Acetyl-CoA carboxylase (ACCase) - a key enzyme in oil biosynthesis with a complex enzyme structure
- C3007 – is a key negative regulator of ACCase
- Yield10 is using genome editing to reduce/eliminate availability of C3007 (*red squares*) to increase the activity of the key ACCase enzyme for increased seed oil biosynthesis



# 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

*Editing targets*

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 equivalent gene in forage crops

**Rice (in progress)**

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

Determine the effect of C4003 on photosynthesis, seed yield and downstream regulator genes

Identify negative regulators as targets for genome editing



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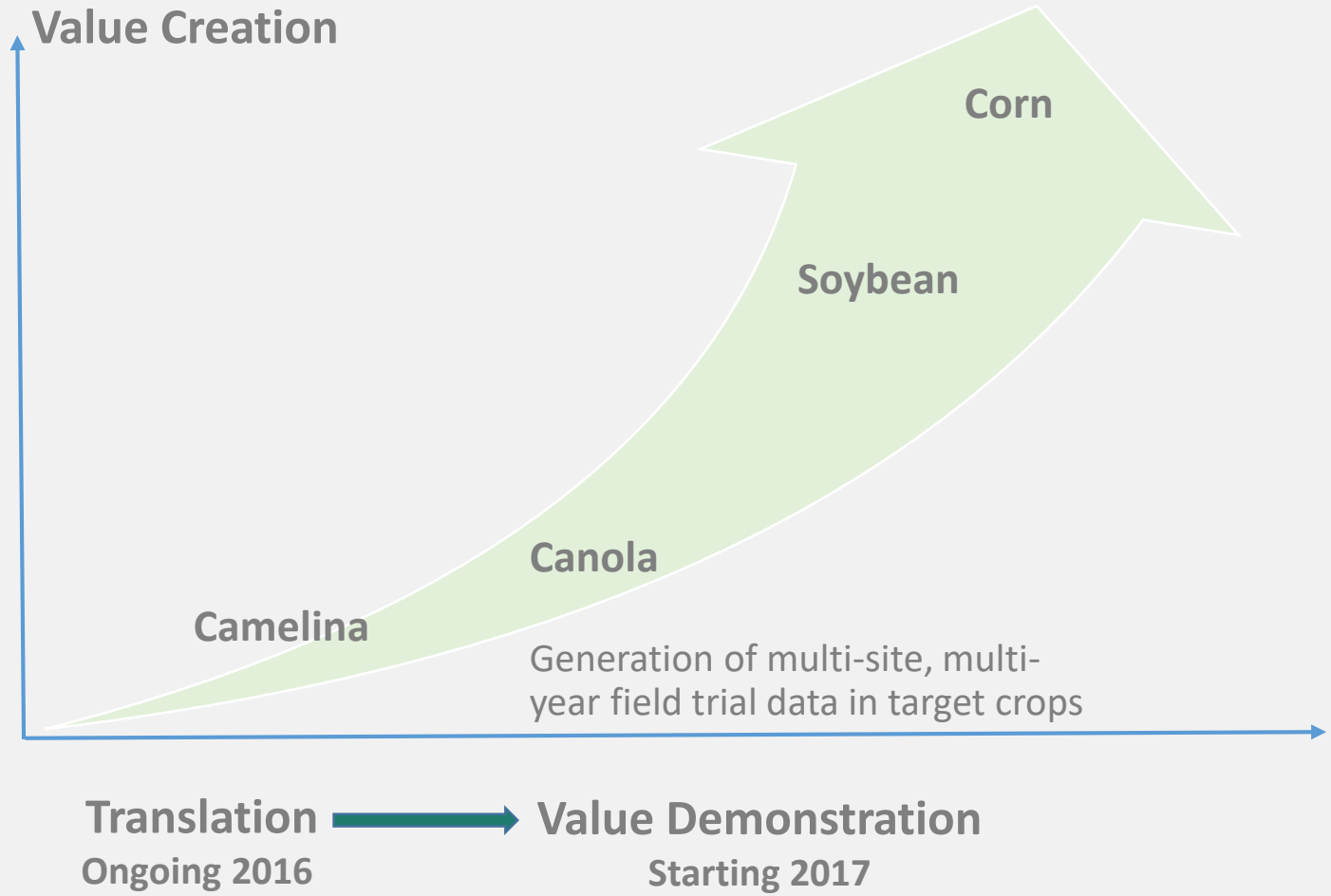
# Value Creation

## 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
  - 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
- 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 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
- Publish technical papers on key technologies

# Wrap up

- Progressing on track to achieve our 2017 milestones
- Executing focused program with C3003 yield trait in oilseed crops and rice
- Leveraging biotech expertise to build value around genome editing targets for key crops
- We have a clear vision for our business – to solve the crop yield problem

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