



Yield10

B I O S C I E N C E

Yield10 Bioscience, Inc.
(NASDAQCM:YTEN)
Investor Presentation

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

March 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, 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**

“Yield10 designs precise alterations to gene activity 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 the Ag space

- 15 recent patent applications for increased crop yield

Applying 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

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

Has numerous opportunities for value capture

Has an organization structured to achieve upcoming milestones

Yield10 Bioscience (NasdaqCM:YTEN) 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 years of cutting edge crop metabolic engineering research
- 15 recent patent applications for increased crop yield
- Focus on major North American crops: canola, soybean and corn
- Open innovation business model provides low hurdle for work with Ag majors

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

Our Team Achieved all Major Objectives in 2017

- ✓ Kicked off 2017 with renaming and rebranding as Yield10 Bioscience, Inc.
- ✓ Added 2 key scientists and board member with agricultural business experience
- ✓ Conducted Field Tests for C3003 in Camelina and canola
- ✓ Reported encouraging results for C3003 in Camelina, canola and soybean
- ✓ 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
- ✓ Secured option from University of Missouri for C3007 technology to boost oil content
- ✓ Received confirmation of nonregulated status from USDA-APHIS for genome-edited Camelina
- ✓ Filed 5 patent applications
- ✓ Signed a research agreement with Monsanto for testing of C3003 and C3004 in soybean
- ✓ Strengthened balance sheet raising combined ~\$15M, net in two offerings of stock and warrants

✓ Granted Research License to Monsanto for Evaluation of C3003 & C3004 in Soybean

- Non-exclusive term of approx. 3.5 years, preserves YTEN downstream rights
- Contributes significant resources and expertise in soybean research and breeding to YTEN C3003/C3004 yield trait program

Goals of the program

- Develop and test C3003 in proprietary soybean lines
- Develop and test C3003 combined with C3004 in proprietary soybean lines
- Test traits in world class Monsanto soybean development program

✓ Completed Field Tests of C3003 and Reported Results in Camelina and Canola

- Reported encouraging results for C3003 in Camelina and canola
- Focusing on construct optimization to characterize the range of yield improvements attainable with C3003
- Seed bulk up and permitting underway for 2018 field tests

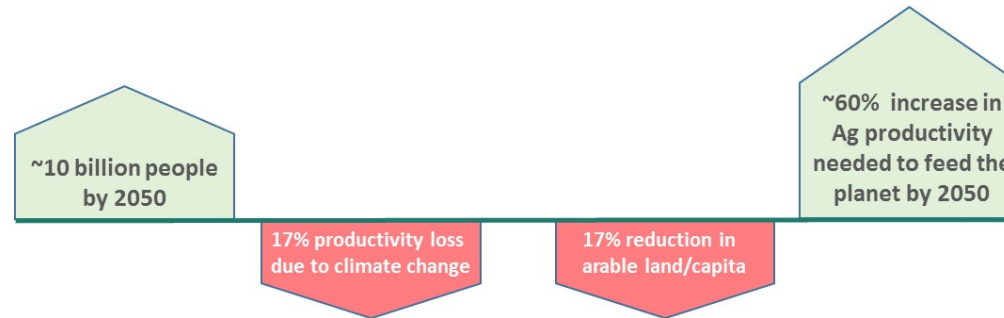
✓ Integrating Technologies for Boosting Oil Content

- Recently completed genome editing in Camelina of triple trait combination C3008a, C3008b, C3009
- Plan to take license to C3007 and C3010, scientific discoveries from University of Missouri
- USDA-APHIS submissions planned to clear the way for future non-regulated US field tests

- Rich pipeline of yield traits in development addresses compelling market opportunity
- Deploying R&D resources to generate proof points in key crops
 - Field tests
 - Greenhouse studies
 - USDA-APHIS submissions
- Opportunities for licenses and collaborations

Yield10: A Compelling Market Opportunity

Yield10 is.....Aligned with compelling megatrends



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

Food Production Must Double by 2050

Global Food Security..... increasing overall demand and increased protein consumption

Health and Wellness.....improved nutrition profile

Food Safety and Sustainability.....growing interest in a “seed to plate value chain”

Innovation.....new technology approaches, “big data/metabolic modeling” and genome editing

Yield10 Technologies Enable Multiple Paths to Value Creation Driven by Unique Traits and Trait Discovery Capabilities



Major 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

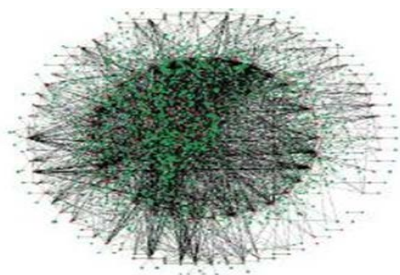


Specialty and Niche Crops including Nutritional Oils

- 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



Rich Pipeline of Trait Genes in Development

SUMMARY OF OUR CROP TRAITS IN DEVELOPMENT	
Business Area	Current Status
Seed Yield Traits-Regulated	
C3003	Camelina 1 st and 2 nd generation at field testing stage Canola 1 st 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
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 underway
C4004 plus 24 additional crop gene targets	Research with rice and wheat next step

Many opportunities exist for licensing and/or partnerships

Granted Research License to Monsanto

Research license to C3003 and C3004 to improve yield in soybean

- Market leader in GM soybean seed in the United States and North America
- Non-exclusive term of approx. 3.5 years, preserves YTEN downstream rights
- Develop and test C3003 in proprietary soybean lines
- Develop and test C3003 combined with C3004 in proprietary soybean lines
- Test traits in world class Monsanto soybean development program
- Contributes significant resources and expertise in soybean research and breeding to YTEN C3003/C3004 yield trait program

“The early development work with C3003 in oilseed plants and its mechanism is very interesting, and we are excited to have the opportunity to explore the potential of this unique yield trait gene in soybean. We are also impressed by Yield10’s metabolic engineering and advanced carbon flux modeling capabilities, as Monsanto is committed to developing solutions that meet farmers’ important needs, while positively affecting modern agriculture’s carbon footprint and overall sustainability.” Janice Edwards, Ph.D., Director, Yield Traits and Disease, Monsanto.

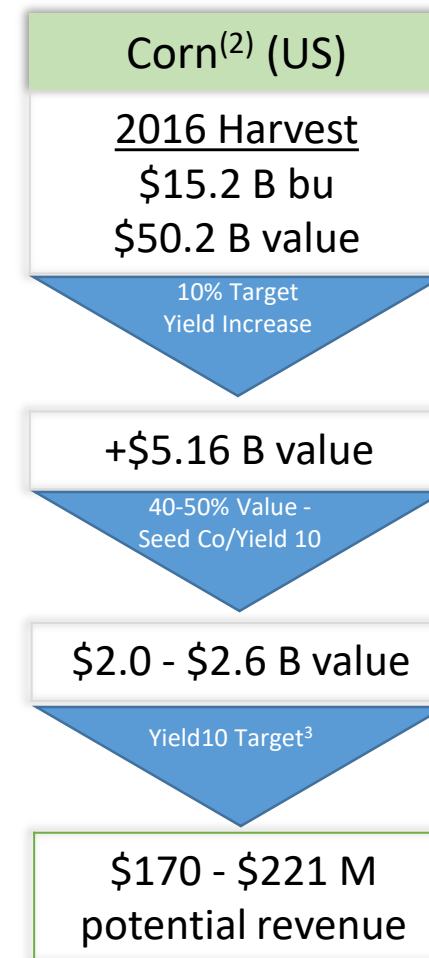
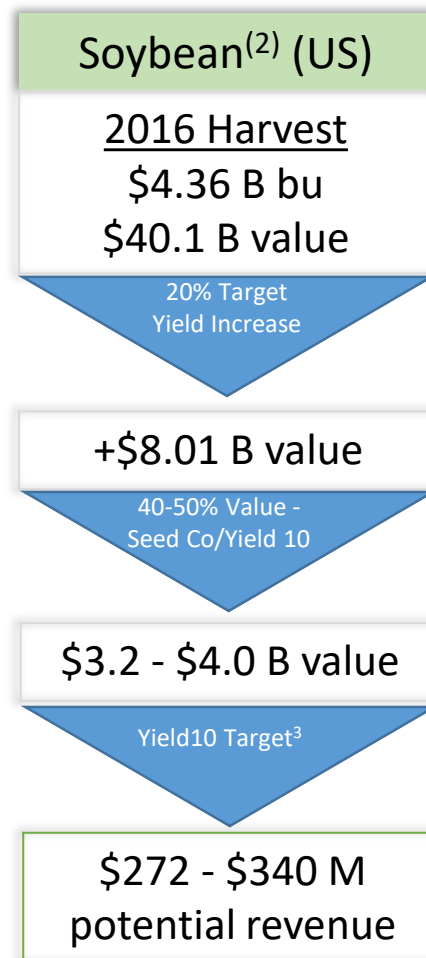
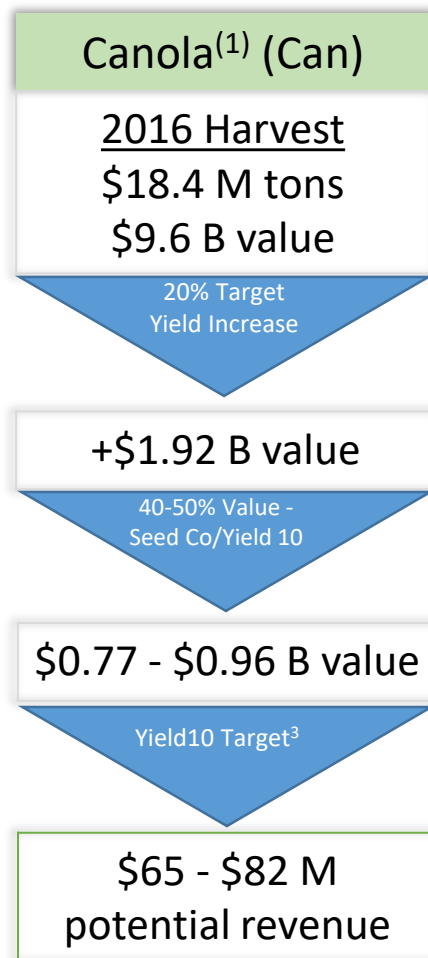


Value Creation Model: Seed Yield and Oil Content

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.



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

Novel Yield Trait Gene: C3003

C3003 is a component of an algal system for increasing photosynthesis in low CO₂ conditions

- A scientific discovery from University of Massachusetts with a unique biological mechanism
- C3003 improves the metabolic infrastructure of the plants
- Potential to be useful in a wide range of C3 crops: Camelina, canola, soybean, corn, wheat, rice and others

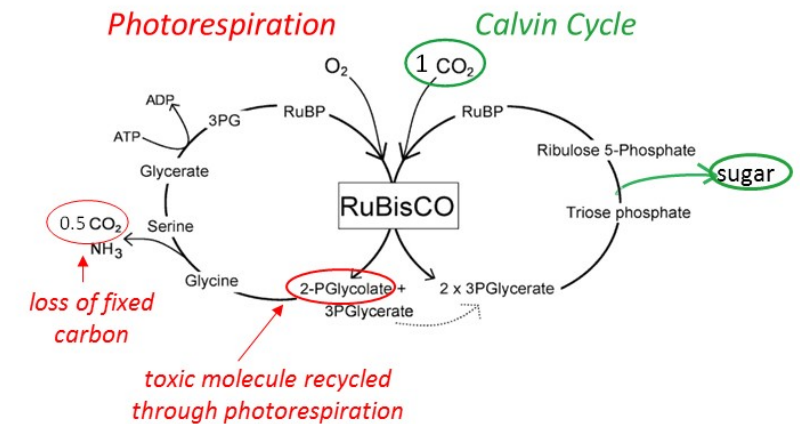
Scientific progress provides new insights on mechanism

- Four additional patent applications filed in 2017
- Recent DOE grant sub-awardee
- Modeling suggests testing in combination with C3004

Research program for C3003

- Leverage the development speed of Camelina to optimize the impact of C3003 in major crops
- Demonstrate Camelina results with C3003 translate into canola, soybean and rice
- Execute 2018 Field Tests in oilseed crops to optimize constructs
- Monsanto license provides a path to test C3003 in elite soybean germplasm and in combination with C3004

C3 photosynthesis reactions



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)

Summary of 2017 Field Test Results

Generated Encouraging Results for C3003 in Camelina and Canola

Objectives

- Conduct first field test with Gen 2.0 C3003 in Camelina and first field test of Gen 1.0 in Canola
- Generate technical data and determine the best way to deploy C3003 in canola and soybean

Results

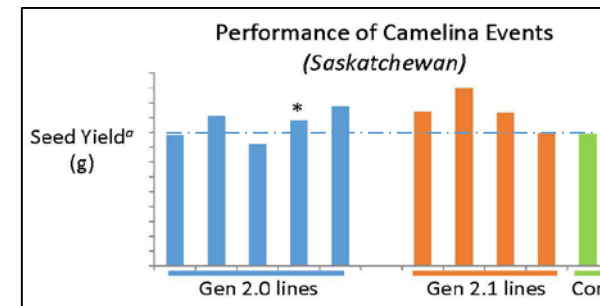
- Camelina: Observed yield increases of 2 to 7% in Gen 2.0 with average individual seed weight¹ increased above control plants in majority of events
- Camelina: Minicage results provide insight into optimizing expression of C3003
- Canola: Observed seed yield improvements of up to 13% in the best lines as compared to controls

Path Forward in 2018

- Camelina: Generate additional data on Gen 2.0 and 2.1 constructs using field grown seed
- Canola: Repeat field tests with Gen 1 canola using field grown seed and scale up Gen 2.0 lines for field testing and develop Gen 2.1 lines
- Execute 2018 field tests in Canada to generate additional proof points for C3003
- Continue research on Gen 3 C3003 constructs including gene combinations

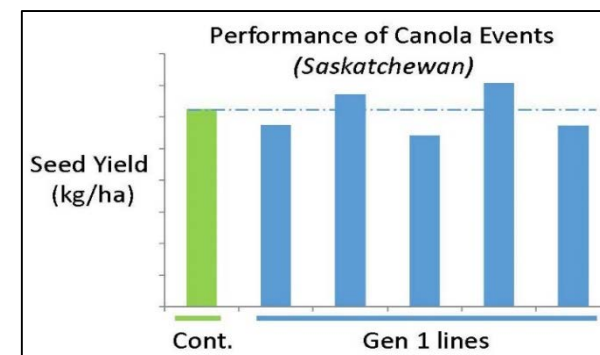
¹ determined by measuring mass of 1000 seeds

Minicage Plots of C3003 Gen 2.0, Gen 2.1



^aSeed yield harvested per cage plot. Values are the average of 2 cages for all data points except * where only one cage was harvested

Field Test of C3003 Gen 1 in Canola



Yield of harvested seed converted to kg/ha based on size of plot. Cont. = control wild-type plants

Generated Preliminary Greenhouse Results for Soybean in 2017 Informing Plans for 2018

Current Status and Recent Results

- Developed Gen 1 and Gen 2 C3003 constructs/events with academic collaborator in Canada
- Preliminary observations from greenhouse grown plants indicate that effects of C3003 translate into soybean
 - Observed lower individual seed weight with soybean Gen 1, typical individual seed weight with Gen 2
 - Preliminary results suggest an increase in branching for some events
- Monsanto researchers working to deploy C3003 into elite soybean germplasm

Path Forward in 2018

- Planning to conduct pilot scale field test in Canada with seed from greenhouse study pending seed availability and permitting
- Planting of seed in field test is anticipated in 2Q 2018
- Progress additional events for Gen 1, Gen 2.0
- Support Monsanto soybean activity with C3003

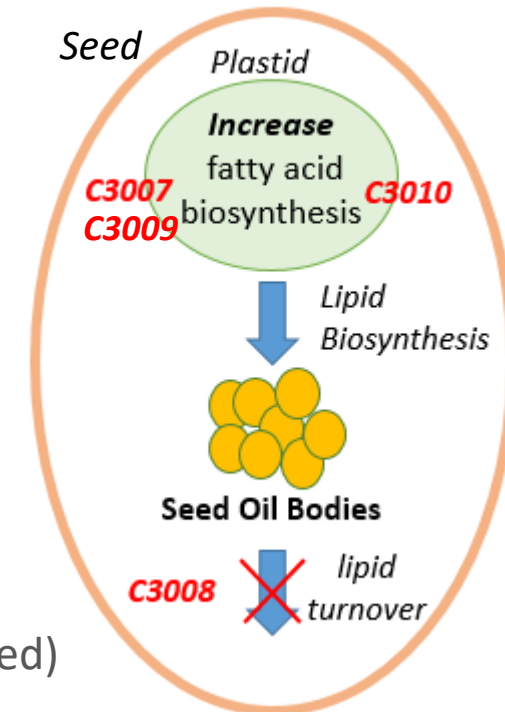
Yield10 is uniquely positioned to re-engineer the oil biosynthesis pathway in oilseed crops

Current Status

- Boosting oil yield significantly increases the value of the crop to the grower
- Discovered and acquired more than 5 targets involved in oil biosynthesis pathway
- 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-regulated¹ trait (C3008a) via a submission to USDA-APHIS in 2017

Next Steps

- Developing multi-gene edited oilseed lines (eg. C3008a, C3008b, C3009 recently completed)
- Building new pathways 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



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

Current Status

- Reported data showing that C4001 boosts key parameter of photosynthesis (~75%) and improves plant biomass (~75-100%) in switchgrass
- Conducting studies of C4001 and C4003 in rice
- Signed collaboration with NRC to improve yield and drought tolerance in wheat using C4001 and C4003, research advancing
- Foundational IP filed and generating additional IP on C4004 plus series traits

Next Steps

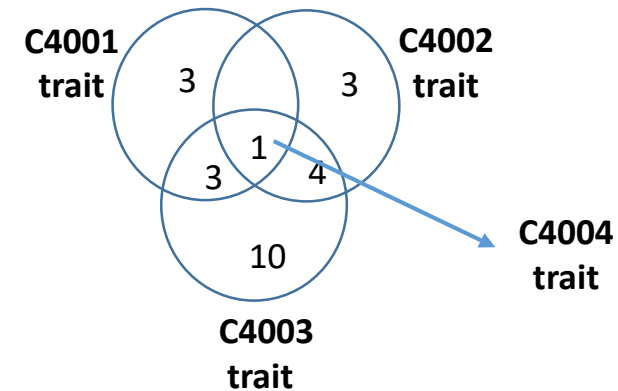
- Generate seed yield data in rice and wheat for C4001 and C4003 traits
- Begin corn transformations to enable greenhouse and field tests
- Increase focus on non-regulated route to increased seed yield and biomass production
- Identify new targets from engineered lines accessible with genome editing and explore combinations



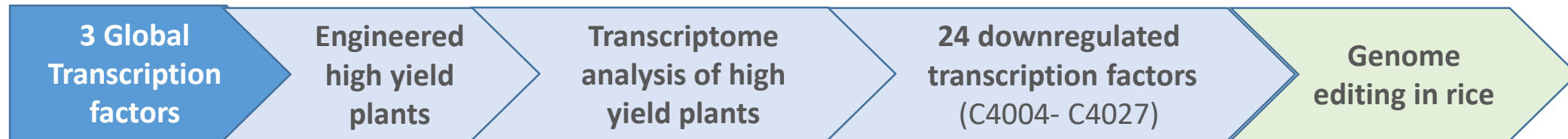
Deactivation of Transcription Factor Genes (C4004 –C4027)

The T3 Platform identifies key downstream transcription factors

- Focus on down regulated transcription factor genes, 24 in total
 - C4004 – C4027, simplest targets for genome editing
- C4004 is the only transcription factor gene downregulated by C4001, C4002 and C4003
 - Tested increased activity of C4004 >>> very small plants
- C4004 is a powerful **negative** regulator of plant growth
- Genome editing of C4004 to reduce activity is underway and plan to edit in combinations with C4005 –C4027



Control C4004 Plants



“T3 Platform”

- Genome editing completes the toolbox for enhancing crop yield and value
 - Genome editing enables **Precision Molecular Breeding** of gene combinations for enhancing crop yield
- Genome edited plants may be nonregulated reducing product development timelines and costs¹
 - Regulated traits: Average 13 years and \$130 M to develop
 - Non-regulated traits: Potential for 3-6 years, less than \$10 M to develop
- Licenses to CRISPR/Cas9 for crops may be readily available²
- The race is on to identify **Smart Editing Target** gene combinations to improve crop performance

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

² <https://broadinstitute.org/news/dupont-pioneer-and-broad-institute-join-forces-enabling>

20 Traits deemed nonregulated by USDA-APHIS may be regulated by EPA and/or FDA

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

- Continue progress on C3003 with additional constructs and crops
 - Planning and permitting underway for 2018 field testing of C3003 in Camelina and canola in Canada
 - Anticipate planting in 2Q 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
- 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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