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

Yield10 Bioscience, Inc.
(NASDAQCM:YTEN)

Investor Presentation

April 2019
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, 2018 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 develops high value seed yield traits for the agriculture and food industries”

- Efficiently developing superior traits for corn, soy, canola, wheat, rice and camelina
- The “Trait Factory” leverages 26 years of Met-Eng investment/achievements
- Optimizing photosynthesis and carbon efficiency to increase grain yield
- Strong leadership and R&D team, operates in Boston, USA and Saskatoon, Canada
Dr. Peoples is a founder of the field of metabolic engineering, the forerunner of synthetic biology and an experienced entrepreneur and biotechnology executive with over 30 years of experience in science and technology innovation, intellectual property development and commercialization. Dr. Peoples led the development of Yield10’s research and business focus.

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.

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.

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

✓ Began early development program in corn
✓ Reported encouraging results for 2018 field tests of C3003 and advanced C3003 into the commercial development phase in canola
✓ Reported first research results on seed yield with C3004 trait in Camelina showing seed yield increases of up to 65%
✓ Supported Bayer/Monsanto in C3003 soybean evaluation program
✓ Signed research license with Forage Genetics for evaluation of traits to increase biomass yield or drought tolerance in forage sorghum
✓ Named Sherri M. Brown, Ph.D., former Monsanto executive, as Special Commercial and Technical Advisor
✓ Raised $2.6 M in registered direct offering of common stock priced at market
Yield10: A Compelling Market Opportunity

Yield10 develops high value seed yield traits for the food industry

The global population is expected to increase to 10 billion people by 2050\(^1\)

Global Food and Ag is a ~ $5 trillion market today

- Milling/Food Manufacturers
- Seed Co
- Farmers
- Supermarket

Food production has to increase by 70-100% by 2050\(^1\)
Increased overall demand, increased protein consumption

Breakthrough grain crop yield traits are essential for global food security

Traits increasing yield by 10-20% would be disruptive to the seed industry

Seed Sector History: Transition From Chemistry to Biology

Insect and herbicide resistance gene traits enabled the farmer to increase revenue

- First gen microbial genes were very successful
- Next?

Patent protected gene traits concentrated revenue in the hands of a few players and drove margins

Monsanto drove revenue and shifted margins from commodity chemicals into seeds and traits

Monsanto Marks Record Sales and Gross Profit in Seeds and Genomics Segment in Fiscal Year 2017, Fueled by Excellent Technology Adoption¹

Seeds and Genomics $10.9 billion
Ag productivity (glyphosate) $0.9 billion

## North American Seed Sector Opportunities

<table>
<thead>
<tr>
<th>Crop</th>
<th>N. America Acres (in millions)</th>
<th>Yield10 Activity</th>
<th>Seed Sector Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canola**</td>
<td>20</td>
<td>Yes</td>
<td>Consolidated value chain, dominated by stacked input traits, path to market through licensing</td>
</tr>
<tr>
<td>Soybean</td>
<td>85</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Corn</td>
<td>90</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td>13.5</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Camelina</td>
<td>potential</td>
<td>Yes</td>
<td>Commercial “white space”</td>
</tr>
<tr>
<td>Wheat</td>
<td>72</td>
<td>Research</td>
<td>Opportunity to participate directly in the seed business or downstream in feed/food products</td>
</tr>
<tr>
<td>Rice</td>
<td>potential</td>
<td>Research</td>
<td></td>
</tr>
<tr>
<td>Sorghum</td>
<td>5.8</td>
<td>License</td>
<td>Large specialty seed businesses usually dominated by 1 or 2 players, path to market through licensing</td>
</tr>
<tr>
<td>Alfalfa</td>
<td>16.6</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

- Rice – ~400 million acres (ex NA). Challenging China and India markets – **Editing may hold promise**
- Wheat – ~530 million acres (~45 million acres in N. America) – **Editing may hold promise**
- **Canola** is underinvested in by the majors due to their focus on corn and soybeans
Yield10 technologies enable multiple paths to value creation

North American Commodity Crops
• Accelerate deployment with Ag majors
• License agreements with milestones and participation in downstream economics

Specialty and Niche Crops including Nutritional Oils
• Focus on development of high value products in food and animal feed
• Develop a non-regulated path to market with participation in downstream economics

Technology Platforms
• “GRAIN” unique approach to identifying gene combinations for editing
• Non-dilutive funding and relationships with leading plant scientists
• R&D support for partner funded programs
Impact of Genome Editing – Non-regulated Traits

A yield trait enables increased crop revenue, where ~60% of the trait value-add goes to the farmer.

Genome editing of traits (CRISPR) reduces cost/eliminates a regulatory barrier.

Enables new business models for some crops and crop attributes.

Enables crop diversification – opportunities for farmers.
Genome-editing could dramatically increase revenue to trait innovators

CRISPR/Cas9 License in place with BROAD/Corteva

Success with USDA-APHIS approvals of single and multi-gene edits in Camelina validates Yield10’s capabilities

GRAIN platform and proprietary high yield plants identify novel targets in major crops for editing

- e.g. C3004 identified in C3003 Camelina enables up to 65% increase in seed yield
- e.g. C4004 identified in C4001 and C4003 switchgrass currently being edited in rice and wheat

   High Plains/Midwest AG Journal, Jan. 19, 2017

2. Assumptions: Yield10 target of 5-12% of the value add for yield traits; used 8% in calculations. Deployment of yield trait through genome editing and non-regulated path (through USDA-APHIS) could enable Yield10 to capture greater proportion of value add based on faster time to market and lower development costs.
## Yield10 Path and Timeline to Value Creation

<table>
<thead>
<tr>
<th>Year Range</th>
<th>“Emerging”</th>
<th>“Growing”</th>
<th>“Harvesting”</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017-2018</td>
<td>Company launch</td>
<td>Build reputation as innovator</td>
<td>Product revenue</td>
</tr>
<tr>
<td></td>
<td>Establishing GRAIN 1.0 trait discovery platform</td>
<td>The “Trait Factory”</td>
<td>Expand range of trait targets (e.g. nitrogen use, pod shatter, etc.)</td>
</tr>
<tr>
<td></td>
<td>Focus on trait discovery</td>
<td>Traits in commercial development</td>
<td>Traits on clear path to market</td>
</tr>
<tr>
<td>2019-2020</td>
<td>Development in: canola, soybean, corn, wheat and rice</td>
<td>Prioritize genome-edited traits</td>
<td>Expand deployment of traits geographically and in additional crops</td>
</tr>
<tr>
<td></td>
<td>Portfolio of traits</td>
<td>Gen 2 traits and trait stacks</td>
<td></td>
</tr>
<tr>
<td>2021-2023</td>
<td>First affiliations</td>
<td>Form revenue generating collaborations, partnerships</td>
<td>Highly sought after partner for trait discovery and development</td>
</tr>
</tbody>
</table>
Leveraging crop expertise of Ag players to deploy Yield10 traits in commercial germplasm, collect field testing data on crop yield performance and provide path to commercial licensing.

In-house expertise in Camelina, canola and rice
Access to expertise in soybean and corn

Research license to C3003 and C3004 for evaluation and field testing in elite soybean lines

Research license to C3003, C4001, C4002, C4003 and C4029 for evaluation and field testing in elite forage sorghum

Yield10 research partner for evaluation of novel yield traits in wheat

Many additional opportunities exist for licensing and/or partnerships.
Yield10 combines advanced discovery with genome editing to develop valuable traits

**TODAY**
- Increased seed yield
- Increased oil content
- Improved stress resistance
- Increased biomass yield

**TOMORROW**
- Specialty oils
- Winter cover crops

**FUTURE**
- Elimination of synthetic chemicals
- Disruptive seed sector business models

Big Data
Examples of Yield10’s Disruptive Capabilities

Prototyping demonstrates Yield10’s disruptive potential

C3003/C3004 traits: 23% - 65% increase in seed yield in oilseed crops
C3005 advanced synthetic biology trait: 128% increase in oilseed yield
C4001, C4003 traits: 70% increase in photosynthesis, 150% increase in biomass

• Current biotech traits (~470 million acres\(^1\)) provide yield protection
• Yield10 has generated proof points demonstrating step-change improvements in yield

\(^1\) Global Status of Commercialized Biotech/GM Crops in 2017, ISAAA
Yield10: Rich Pipeline of Trait Genes in Development

Many opportunities exist for licensing and/or partnerships

<table>
<thead>
<tr>
<th>Yield Traits</th>
<th>Target Crops</th>
<th>N. A. Acreage Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Seed yield: carbon conversion efficiency traits</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C3003, C3004(^1), C3011</td>
<td>canola, soybean(^2), corn, sorghum</td>
<td>200 million</td>
</tr>
<tr>
<td><strong>Oil enhancing traits(^1)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C3007, C3008a, C3008b, C3009, C3010</td>
<td>canola, soybean</td>
<td>110 million</td>
</tr>
<tr>
<td><strong>Seed and biomass yield: gene regulator traits(^1)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C4001-C4003</td>
<td>wheat(^3), rice(^3), corn and sorghum</td>
<td>140 million</td>
</tr>
<tr>
<td>C4004</td>
<td>wheat, rice</td>
<td>45 million</td>
</tr>
<tr>
<td>C4029</td>
<td>sorghum</td>
<td>5 million</td>
</tr>
</tbody>
</table>

\(^1\) traits accessible with genome editing; not regulated by USDA-APHIS, could be regulated by EPA and/or FDA and/or regulated in EU, Canada

\(^2\) An additional 130 million acres of soybean potential in S. America

\(^3\) Market for rice is fragmented; est. 2 million acres US; 400 million acres ex-US
Field Test  **C3003 in Canola**

Objective: Generate multi-site field data to identify commercial quality events and data to drive partnership discussions

- Test C3003 Gen 2.0 in canola
- Generate field grown seed for 2020 field tests
- Planting expected in Q2, expect to report data in Q4
- Continue to support Bayer/Monsanto in evaluation of C3003

Field Test  **C3004 in Camelina**

Objective: Generate multi-site field data to validate impressive seed yield results (up to 65% increase) obtained in growth chambers

- Collect agronomic and initial seed yield data
- Generate field grown seed for 2020 field tests
- Generate data to drive partnership discussions
- Continue work to deploy trait in canola and corn
Expression of C3004 Significantly Increases Seed Yield in Camelina

Developing strategies to deploy C3004 as a nonregulated trait in key crops

- High yield C3003 Camelina plants enabled identification of C3004
- Engineer increased activity of C3004 alone in Camelina >>seed yield increase up to 65%
- Field testing planned for 2019, accelerate C3004 trait into soybean and canola
- Develop non-regulated, genome-edited versions of C3004 for key crops

Seed yield impact of C3004

<table>
<thead>
<tr>
<th>Lines</th>
<th>Seed Yield (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WT</td>
<td>6</td>
</tr>
<tr>
<td>OY03</td>
<td>8</td>
</tr>
<tr>
<td>OY04</td>
<td>10</td>
</tr>
<tr>
<td>OY12</td>
<td>11</td>
</tr>
<tr>
<td>OY15</td>
<td>12</td>
</tr>
<tr>
<td>OY16</td>
<td>12</td>
</tr>
<tr>
<td>OY17</td>
<td>12</td>
</tr>
</tbody>
</table>

Student’s t-test, \(*p<0.05\); Data average of 3 to 4 plants per line

Up to 65% increase in seed yield in C3004 plants
Focus on CRISPR genome-editing strategies for key food crops

**Opportunity:** Large global acreage (~950 mm acres), highly fragmented market, no dominant players

**Challenge:** Public concern around GMO technologies in staple food crops

**Yield10 Approach:** Deploy yield traits using CRISPR genome-editing of novel targets identified using GRAIN platform

- C4000 series traits produced significant increases in photosynthesis and biomass yield when tested in switchgrass
- Conduct testing of C4004 in wheat and rice
- Identify collaborative opportunities to test traits in commercial varieties
Yield10 is working to advance our crop yield technologies and build collaborations

- Continue commercial development of C3003 in canola and other crops (soybean, corn)
  - Focus on C3003 development in canola through creation of additional events and testing in elite germplasm
    - Generate field data and field grown seed in 2019 field testing program
    - Support Bayer/Monsanto in development of C3003 and C3004 traits in soybean
    - Continue independent evaluation of C3003 in soybean, rice and corn
- Report data from C3004 Camelina 2019 field tests, fast-track into canola and corn
- Report progress on oil boosting traits using CRISPR genome-editing, including C3007/canola
- Report progress on C4000 series traits in wheat and rice
  - Support Forage Genetics in forage sorghum
- Secure revenue generating Ag industry collaborations
- Build our intellectual property portfolio
- Communicate our scientific innovations in technical presentations and papers
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