



BIOSTL
DRIVING ST. LOUIS INNOVATION

Transforming the St. Louis & Missouri economy
through **innovation, global connectedness,**
and bridging **urban-rural communities**



The Scope of St. Louis “Bioscience”

- Medicine and human health

- Pharma / Therapeutics
- Medical devices
- Diagnostics

- Health IT / digital health



- Plant and agriculture science

- Ag traits: enhanced yield, drought and pest resistance, etc.
- Bioenergy / fuels

- Animal health



History

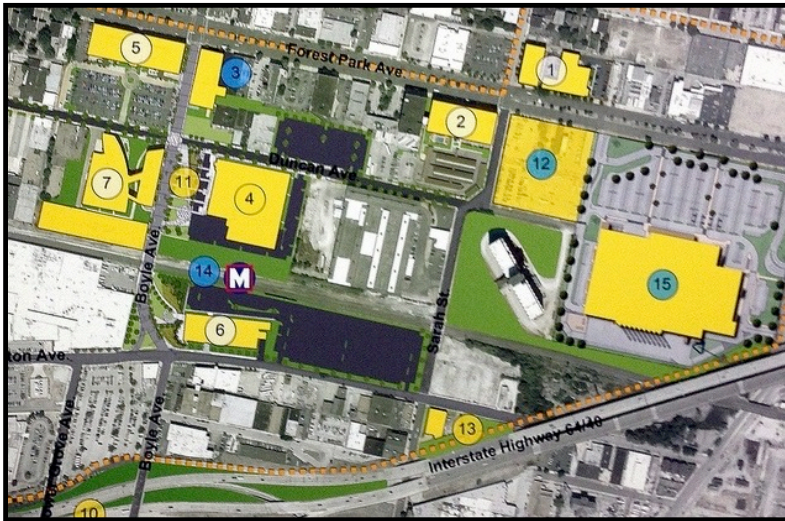


Dr. William Danforth
Chancellor Emeritus,
Washington University in St. Louis

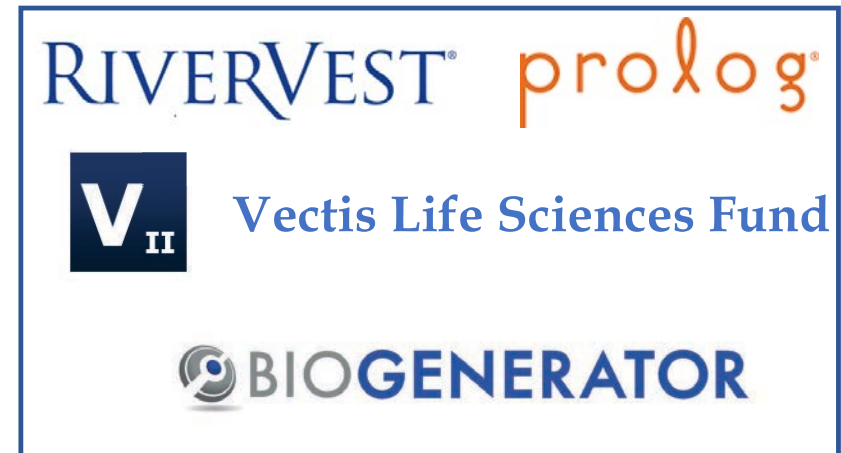
- St. Louis in 2000: Zero entrepreneur infrastructure
- Civic Progress and Danforth Foundation funded Battelle study
- Dr. Danforth convened civic leaders:

The Coalition for Plant and Life Sciences
(Predecessor of BioSTL)

The First Years



- Established CORTEX district
- Supported development of BRDG Park
- Missouri Life Sciences Trust Fund



- Jumpstarted local venture capital
- Launched BioGenerator
- Protected research freedoms

Components of an Ag Innovation Ecosystem



St. Louis Network of Collaborators



INVENTIONS

Danforth Center
Washington University
University of Missouri
St. Louis University
Industry leaders



TALENT

1,000+ Plant Science
PhDs
Education and Training
Skilled Labor
Culture
Accelerators



COMMERCIALIZATION /BUSINESS SUPPORT

BioGenerator
Danforth Center
EAGIC
GlobalSTL
SBDC
Yield Lab



FUNDING

Advantage Capital
Arch Grants
Bayer Grants4Ag
BioGenerator
Capital Innovators
Leaps by Bayer
Lewis & Clark AgriFood
Lagomaj
Rabo Agrifinance
Tech Accel
Yield Lab
Wells Fargo IN² Innovation
Incubator



ACCESS TO MARKET

Within 500 mile radius, 50%
US ag production
\$88 Billion MO industry
National HQ of
National Corn Growers
American Soybean
Association
US Farmers and Ranchers
in Action

INFRASTRUCTURE



Laboratories; Greenhouses; Plant Transformation; Proteomics;
Data Science; Advanced Bioluminescence; BRDG Park; Helix Center
BioGenerator Labs; 39 North

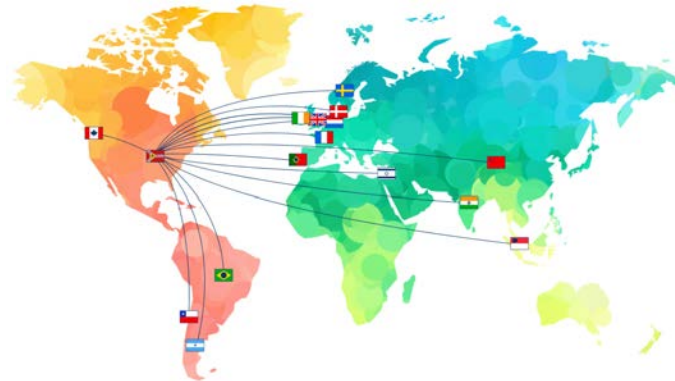


BIOSTL
DRIVING ST. LOUIS INNOVATION

Creating & Building
Quality, Homegrown Startups

Global Recruitment of
High-Growth Innovators

Building the Innovation &
Entrepreneurship Ecosystem



Infrastructure



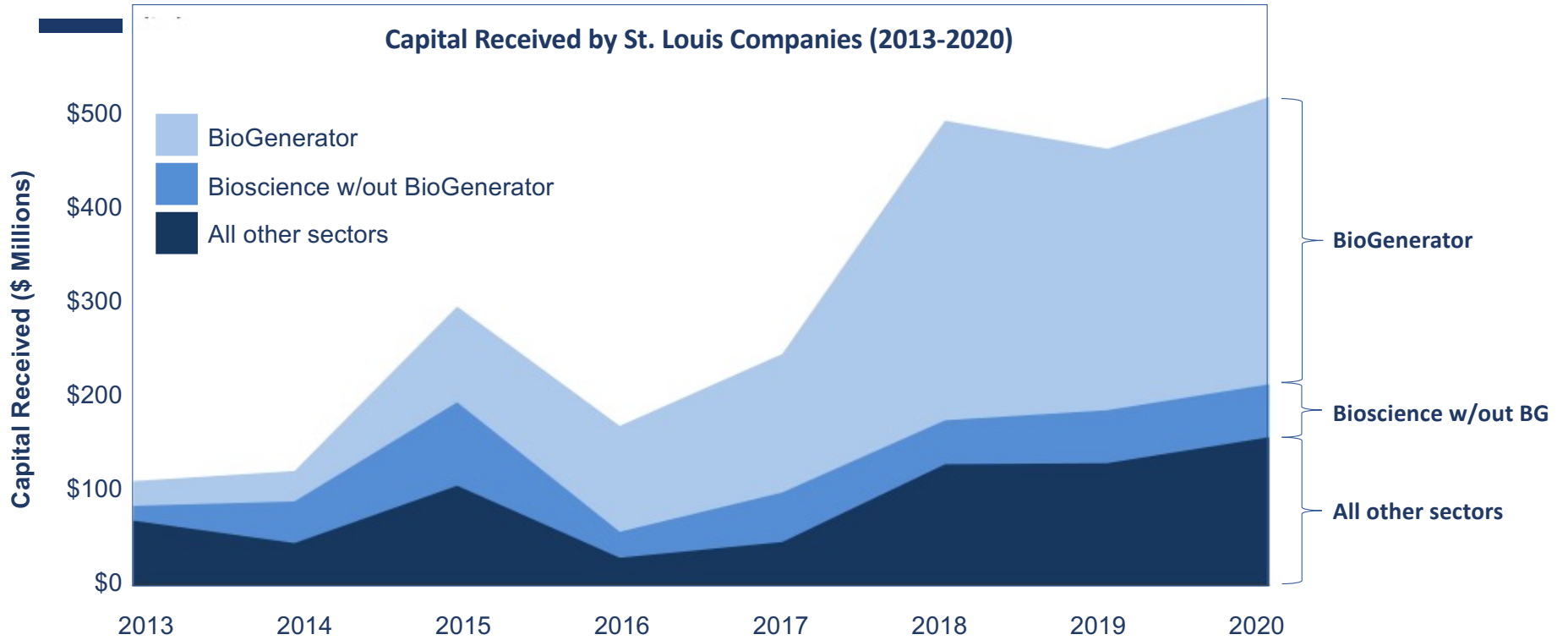
INNOVATION ADVOCACY COUNCIL
JOBS AND PROSPERITY THROUGH INNOVATION



\$2.2B
raised by our portfolio companies
(Invested \$37MM into **95 STL startups**)

85%
of funding coming from outside
St. Louis

185+
global venture and strategic
investors invest in BioGenerator
companies





BIOGENERATOR
THE INVESTMENT ARM OF BIOSTL

BioSTL's First 2 Unicorns



- Ex-Pfizer team and Washington University founders
- Platform for treatment of inflammation and cancer
- BioGenerator was 1st investor; helped launch the company
- Acquired by Aclaris Therapeutics (Nasdaq: ACRS) in 2017
- 50+ employees in Cortex; many ex-Pfizer layoffs
- Prototype client of BG Labs and BioSTL Building

BENSON HILL



- Industry and Danforth Plant Sciences Center founders
- Platform for improving nutritional quality from plant crops
- BioGenerator was early investor in the company
- Rapid growth to >180 St. Louis employees
- Anchor tenant in new BRDG Park building
- Nationally known Agtech with potential for major impact

Agtech-focused Activities

Achieve regional preeminence in the advancing AgriFoodTech innovation



- Harness regional talent
 - EIR; Team of 7 advisors; network of 60+
- Identify and advance unmet needs and opportunities
 - EDA funding for feasibility for build out of ag-critical infrastructure (bioprocessing/bioreactor)
- Provide enabling services and support (Startup Toolkit)
 - Crop model to value ag sector investments
 - Probability of Success (POS) Phase Advancements to De-Risk Ag Concepts and Improve NPVs
- Secure capital (including non-dilutive capital)
 - Launch G2B Ag (built around DOE, NSF, DoD/NGA, and USDA deadlines)
 - Formed Monsanto alumni team to build 'Ag NewCo' focused on sustainability



Leveraging buying power as a magnet to recruit and connect top global innovation to our region's Ag-Food corporations



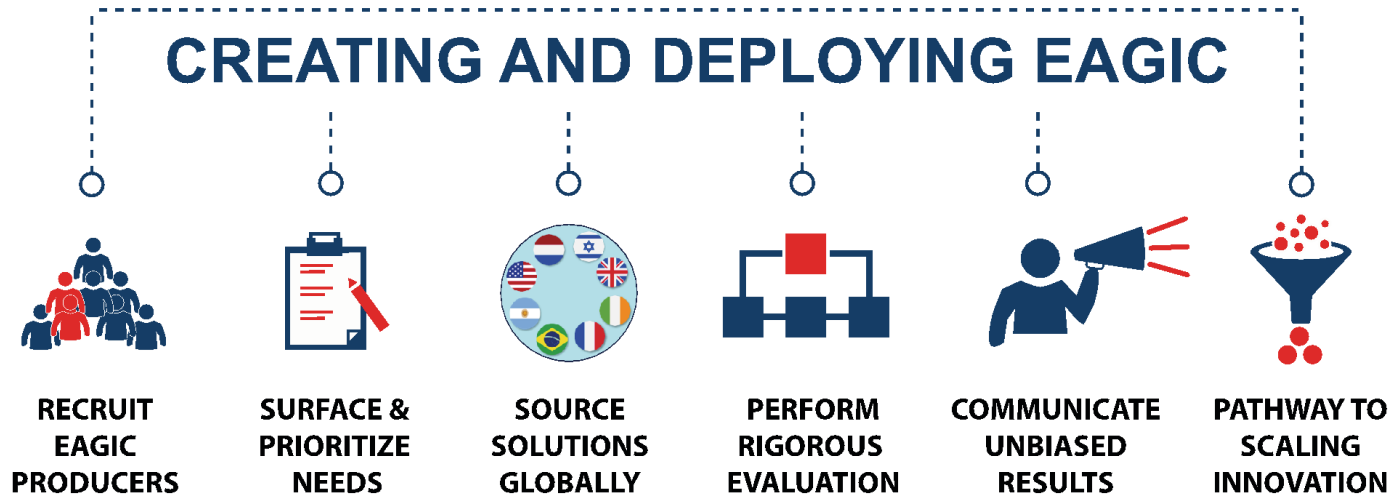


GLOBALSTL
AN INITIATIVE OF BIOSTL

Early Adopter Grower Innovation Community (EAGIC) - Making Missouri Producers Globally Competitive

- Grower-Innovator-Researcher: Rigorous Pilots
- 240+ growers across 4 states
- Represent over a 250,000 acres of row crops, livestock, and specialty crop operations

- 4 on-going pilot projects (tech from Canada, Israel, U.S.)



Grower Shopping List - Unmet Needs



Needs Group into Categories

- **Connectivity:** Rural broadband, sensor networks, edge computing
- **Labor:** Shortage of farm labor, aging farming population, smarter not harder, save time
- **Increase Yield:** Innovations to bump production
- **Lower Costs:** Low commodity prices drive need to lower costs of inputs, efficiencies
- **Environmental:** nutrient loss reduction strategy, crop protection plans, soil loss

Leveraging buying power as a magnet, GlobalSTL is recruiting and connecting top global innovation to our region's healthcare organizations



\$365B
of Purchasing Power
~10%
of US Healthcare spend

Center for Rural Health Innovation



The Center's mission is to **strengthen the health and economic vitality** of rural communities through innovation and partnerships (convening rural buying power) to deliver results across Missouri.





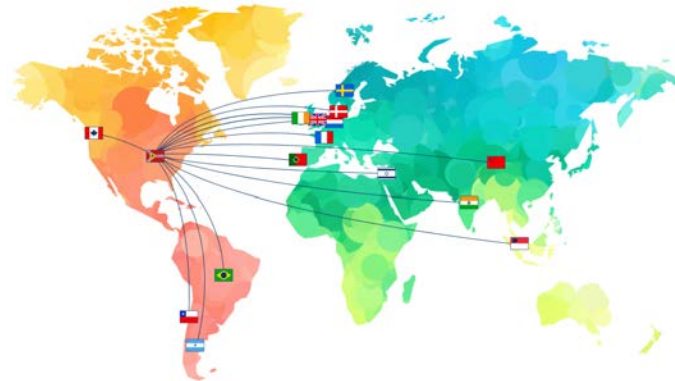
BIOSTL

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Creating & Building Quality, Homegrown Startups

Global Recruitment of High-Growth Innovators

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Infrastructure



INNOVATION ADVOCACY COUNCIL
JOBS AND PROSPERITY THROUGH INNOVATION



The 39 North Innovation District

Bayer Crop Science

Helix

Danforth/BRDG Park

39°N

- A 600-acre area of mixed-use activity and development
- Anchored by Danforth Center, BRDG Park, Helix Incubator, Benson Hill, Bayer Crop Science, Yield Lab, and others
- Enhances our region's ability to grow, attract, and retain top talent

[Learn More 39NorthSTL.com](http://LearnMore39NorthSTL.com)

BRDG and EDGE@BRDG



270,000 square feet

12 enterprises

St. Louis Community
College biotech
training program



BENSON HILL

- Danforth Center spinout – co-founded by Todd Mockler, PhD
- CropOS® combines AI and genetics to deliver consumer-centered crops, faster!
- Went public in 2021 a \$1.35B deal (BHIL)



DONALD DANFORTH PLANT SCIENCE CENTER

World's Largest Nonprofit Independent Plant Research Institute

396
Employees
from
20 countries

31
Scientific teams
199 funded
projects

\$40M
Annual operating
budget

1718
Scientific
publications

2 members
National
Academy of
Science

9 startup
Companies
launched by faculty

2 Institutes
Focused on renewable
energy and improving food
security crops

\$250M
In research funding from
government agencies, industry
& foundations

\$352M
In annual economic impact to
the St. Louis region



BIOGENERATOR VENTURES

BioGenerator Ventures creates, builds, and invests in companies that are solving important problems in healthcare and agriculture.

BIOGENERATOR LABS

BioGenerator Labs bring together technology, talent, proof of concept grants, coaching, grant training, and innovative laboratory space in a suite of programs designed to accelerate new ventures.

BUILDING COMPANIES



INVESTMENTS



COACHING



EXECUTIVES IN RESIDENCE



LABS / EQUIPMENT



VC FELLOWS



BG GRANTS



CAPITAL FORMATION



WINNING SBIR/STTR





BIOGENERATOR
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Creating, Building & Investing in Startups



\$2.2B

raised by our portfolio companies
(Invested \$37MM into **95 STL startups**)

85%

of funding coming from
outside St. Louis

185+

global venture and strategic
investors invest in
BioGenerator companies

Select Investors

- Novo Holdings A/S – *Copenhagen*
- Menlo Ventures – *San Francisco*
- Google Ventures – *San Francisco*
- Qiming Venture Partners – *Shanghai*
- Clarus Ventures – *Boston*
- Sofinnova Ventures – *San Francisco*
- ARCH Venture Partners – *Chicago*
- F-Prime Capital – *Boston*
- Atlas Venture – *Boston*
- Novartis Venture Fund – *Basel, Switzerland*
- HBM Healthcare Investments – *Zug, Switzerland*
- Roche Venture Fund – *Basel, Switzerland*

PORTFOLIO COMPANY NEWS: COVERCRESS

Background

- Developing a new winter crop to protect topsoil, the environment, and to generate winter revenue where there is none today

BioGenerator's Impact

- EIR was founding CEO
- Grants, Labs, EIRs, USDA SBIR
- First professional investor in the company
- Full due diligence provided to many investors
- Lead investor from 2014-2021 through multiple financings from inception to Series B

Current Snapshot

- Closed \$8M Series B w/ participation from Bunge, REG, Bayer, and multiple VCs
- Round funds through initial commercial launch and potentially to exit



BENSON HILL: A POTENTIAL EXIT FOR ST. LOUIS

Summary

- Agtech company providing healthier, better-tasting, and traceable food ingredients and quality fresh vegetables

The Beginning

- Formed in 2012 | Agtech hub in NC
- Initial friends and family capital to company with NC focus

BioGenerator Phase

- Active lead investor | Relocated to STL
- Invested naked twice in pre-Series A period
- BG brought in multiple Seed and Series A investors

Achieving Scale

- ~\$300M in capital raised following BG's 1st investment
- 160K SF headquarters & 47K SF research bldg. in 39N
- 337 employees | 120 with advanced degrees

Potential Exit

- Star Peak Corp II (NYSE: STPC) a “blank check” SPAC
- Benson Hill (NYSE: BHIL) expected mkt cap of ~\$2B



BENSON HILL™

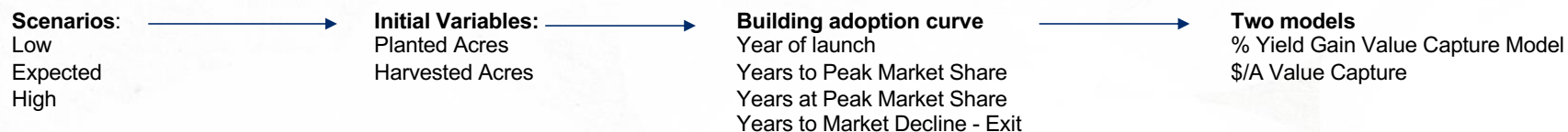


AgriFoodTech Initiative is Building a Startup Toolkit - First component, Crop Model

Ability to value ag sector investments to help enable funding and product advancement decisions:

1. Key commercial product concepts consistent with technical concepts
2. Size of market opportunity by key crop (corn, soy and cotton as pilot models), delivery platform and country (US, Brazil and Mexico)
3. Potential market share opportunity given current and future competing product technologies
4. Potential value capture (value share) by market opportunity, crop and country
5. Estimated COGs by product concept
6. Estimated R&D and SG&A investments
7. Net Present Value and key value driver sensitivities
8. Risk Adjusted Value: (1) Technical, (2) Regulatory, (3) Commercial, (4) Public Acceptance and (5) Discount Count Rate
9. A tool available to all St. Louis regional ag startups from BioGenerator to help them with their financial modeling
10. ***Ability to leverage information across multiple BioGenerator Ag Sector investments***

US Corn Model



% Yield Gain Value Capture Model – Inputs:

- Share of Target Acres (%)
- Penetration of Target Acres (%)
- Crop Market Price (\$/Bu)
- Product Concept Yield Gain (Bu/A)
- Value Capture at Launch (% of Yield Gain)
- Value Capture to Peak Mkt Share (% of Yield Gain)
- Value Capture at Peak Mkt Share (% of Yield Gain)
- Value Capture to Market Decline (% of Yield Gain)

% Yield Gain Value Capture Model – Inputs:

- Share of Target Acres (%)
- Penetration of Target Acres (%)
- Price at Product Launch (\$/A)
- Price to Peak Market Share (\$/A)
- Price at Peak Market Share (\$/A)
- Price to Market Decline, Exit (\$/A)

Outputs:
Effective Price (\$/A)
Revenue Forecast

Adjustments:
COGS
Inventory

Adjustments:
R&D expenses
SG&A

Adjustments:
Depreciation
Amortization

Adjustments:
Interest
Taxes

Gross Profit

EBITDA

EBIT

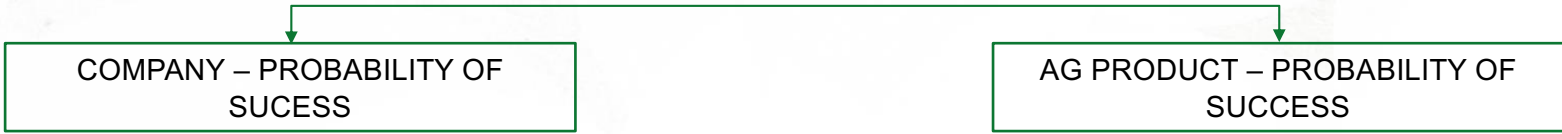
Net Profit

NPV
EV

Discounted Cash Flow @ WACC – US, Brazil and Mexico

FCF

Draft Concepts - Use Probability of Success (POS) Phase Advancements to De-Risk Ag Product Concepts and Improve NPVs



BIOGENERATOR:

Framework for Evaluating Potential Company Success – Probability Weighted Multiple of Invested Capital

	Market	Product	Team	Financial	
Stage 1	Compelling Reasons to buy Adopted by Visionary customers	Product functionality	Capability of CEO	Viable business model	
	90%	90%	90%	80%	58%
Stage 2	Predictable sale cycle Proven Value proposition Critical mass of customers	Product wholesomeness	Completeness of team Healthy team dynamics	Healthy gross margins Healthy near term Runway	
	80%	80%	75%	80%	38%
Stage 3	Proven in multiple niche Marquee customers No adverse Govt regulations Impact	Scalable product and continuity	No Execution blow ups Good Board of directors	Healthy net margins	
	80%	90%	90%	80%	52%
Stage 4	Proprietary structure	High Switching costs	High Barriers to entry	Differentiated offering	No Substitutes
	0	1	0	1	1
	Market Leader	0			
	Challenger	0.5			
	One more player	0.5			

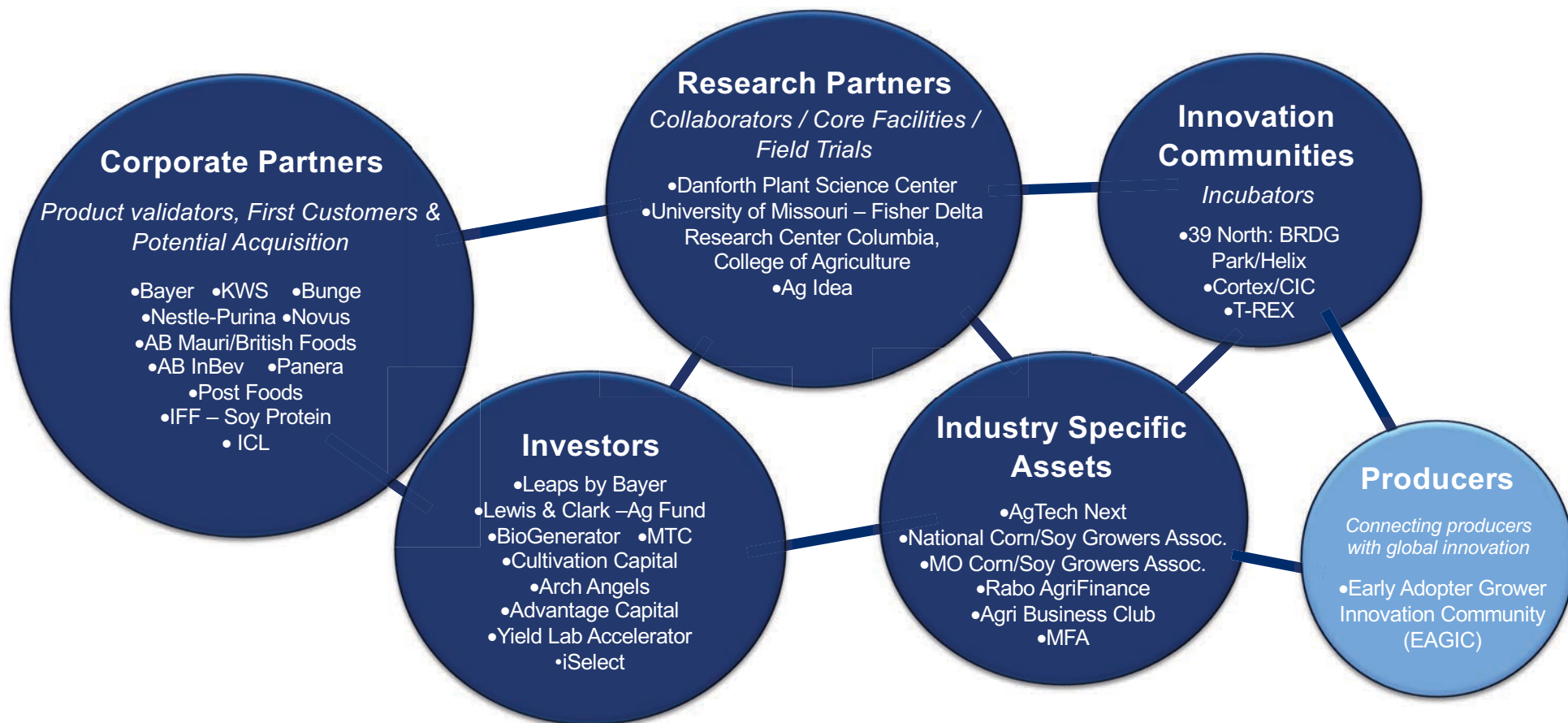
BIOGENERATOR:

Framework to De-Risk Ag Product Concepts and Improve Product Success

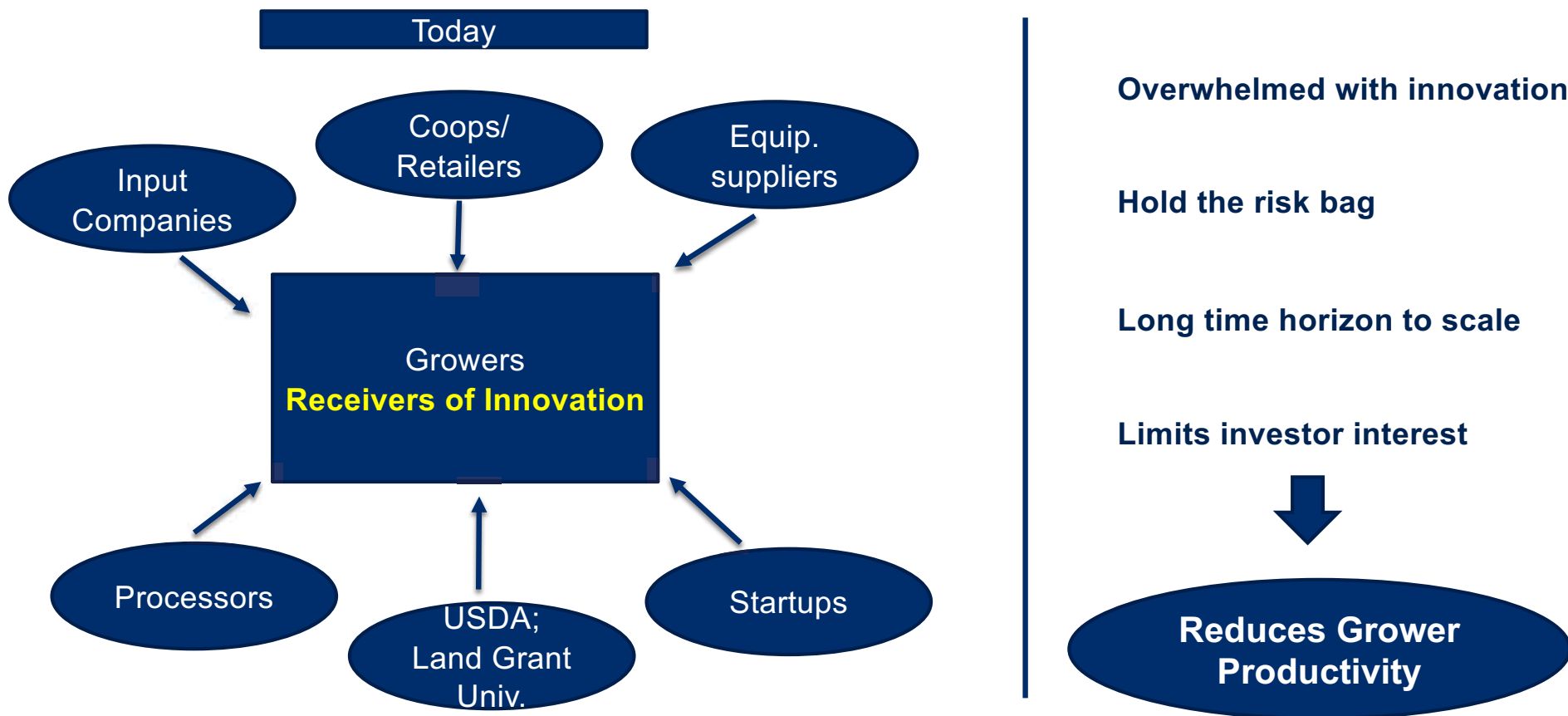
	Most Ag Product Concepts at BioGenerator?					
	Discovery	Phase 1 Proof of Concept	Phase 2 Early Development	Phase 3 Late Development	Phase 4 Pre-Commercial	Commercial Launch
Technical POS	X%	X%	X%	X%	X%	X%
Regulatory POS	X%	X%	X%	X%	X%	X%
Intellectual Property POS	X%	X%	X%	X%	X%	X%
Commercial POS	X%	X%	X%	X%	X%	X%
Public Acceptance POS	X%	X%	X%	X%	X%	X%
TOTAL POS	5%	25%	50%	75%	90%	Launch Product

Need to identify correct POS % for BioGenerator Ag Products

St. Louis Ag/Food Tech Ecosystem: GlobalSTL leveraging platform



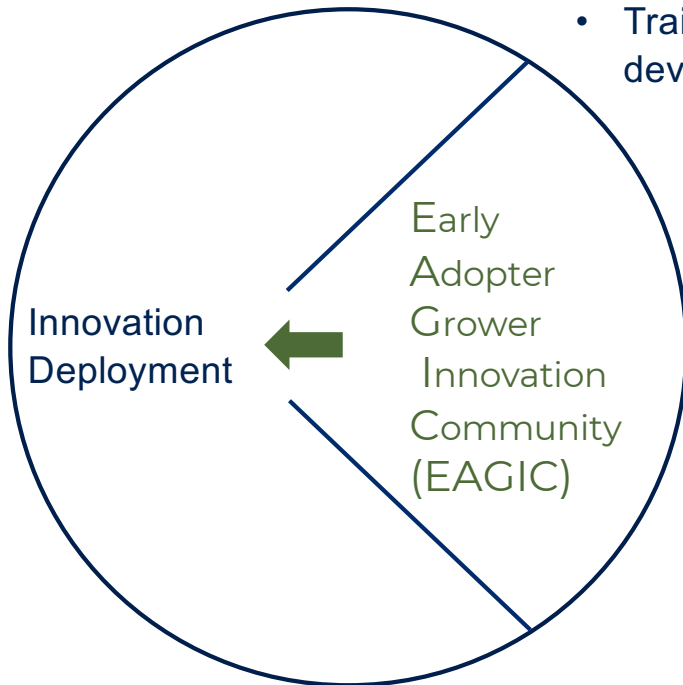
Growers innovation pathway – Today



EAGIC – unique value proposition: changing the trust paradigm

- Early adopter growers: Grower-centric
- Global innovation sourcing platform
- Grower-Innovator-Researcher: Rigorous Pilots
- Training & hiring local talent: workforce development

Midwest Growers



Ag/Food “Global Shopping List”

Agriculture Tech Innovation Priorities '21

- Reducing Environmental Impact of Agriculture
 - GHG emissions, carbon neutral, H₂O management, soil health
- Improving Product Focused R&D
 - Native / enhanced traits to protect crops, improve tolerances & yield
 - Increasing genetic diversity of crops
 - Novel crop chemistries safe for humans and environment
 - New foliar and seed applied natural crop protections
- Scalable & Sustainable Alternative Proteins
 - New plant protein systems & protein fermentation processes
- Increasing R&D Efficiency
 - Methods for optimizing traits, lab automation & agronomic practices
 - Technologies to detect pesticide residues and assess soil health
- Irradicate Insect-Borne Infections
 - Malaria, Dengue Fever, Yellow Fever and Japanese Encephalitis
- R&D Data Science and Digital Business Models
 - Enhanced AI, modeling and predictive analytics
 - Novel approaches & imaging technologies to analyze complex data

Food & Feed Tech Innovation Priorities '21

- Alternative Proteins
 - Plant and cell-based proteins
 - Fermentation techniques and products thereof
- Healthy Human & Pet Food Ingredients
 - Healthy aging
 - Muscle retention & mass building, non-pharma
 - Weight management
 - Probiotics
 - Diabetes, heart health, & brain health
- Digital Pet Healthcare
- Packaging Science
 - Recyclable, paper-based, biodegradable packaging
- Diagnostics Kits
 - Non-invasive tests/diagnostics
- Production Animal / Aquaculture Micronutrients
- Traceability, Efficiency, Food Safety
 - Enhanced quality control from input providers

Network of Partners



Grower feedback

Blake Hurst, Westboro, MO, former MO Farm Bureau President

*“In my experience some companies are re-miss in ground-truthing these technologies on the farm. I see **EAGIC** trying to bridge that gap between tech development in the lab and use of technology on the farm in the dirt and grime of the real world. “*

Jake Perino, Deer Grove, IL

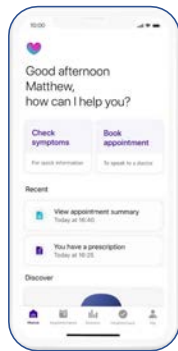
*“Farming these days is like trying to keep up on the technology treadmill. You have to keep trying new things or you fall behind. **EAGIC** offers the advantage of paring down the list of solutions to the ones that affect me most.”*

Ken Dalenberg, Mansfield, IL

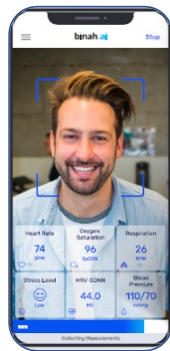
*“I’m always trying new things on my farm. Been reviewing new technologies for decades. **Working with EAGIC** helps me find the short list of tech that is **available**. They keep me aware of new finds as well as sharing solutions that directly relate to my needs. **It’s an easy choice to be part of the program.**”*

New model of rural health: “Bring the care to the person”.

Deploy innovation sourced by GlobalSTL.



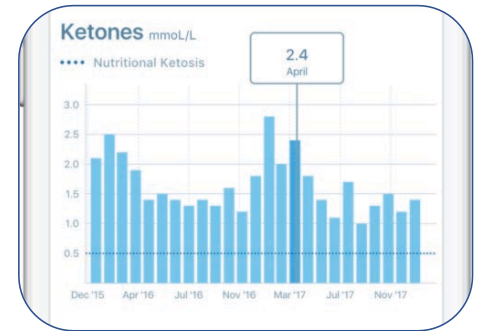
Babylon Health
24/7 Primary Care



Binah
24/7 Remote Monitoring



SWORD Health
Tele Physiotherapist



Virta Health
Reverse Diabetes from home



Our Programs

Space from
Anxiety

Personalized pathways
Online Modules help students to face and manage anxiety step by step. Topics include:

- Understanding your feelings and thoughts
- Worry monitoring and management
- Exposure strategy
- Addressing your core fears
- Identifying negative thinking
- Cognitive restructuring
- Consolidation & relapse prevention

Space from
Depression

Personalized pathways
Online modules help students to increase positive behaviors and feel better about themselves and the world around them. Topics include:

- Tuning into mood
- Sorting thoughts/distorted thinking
- Boosting behavior-motivation, activity levels
- Challenging negative thoughts
- Identifying negative thinking
- Balance on core beliefs

Space from
Stress

Personalized pathways
Online modules help students to manage the symptoms of stress and develop skills to successfully create school-life balance. Topics include:

- Stress management
- Problem solving/goal setting
- Communication & relationships
- Helpful thinking
- Self-esteem

SilverCloud
24/7 Mental Health



Coala Life
Tele Cardiologist



Strategy for Strengthening Economic Vitality of Rural Missouri

BioSTL Programs

Center for Rural Health Innovation

EAGIC

Solving For

Healthcare Access & Affordability

Digitally enabled rural economies: Broadband

Workforce (Ag + Healthcare) – digital economy jobs: Training & hiring local talent

Value Added Manufacturing

Outcomes

Economic Vitality
Digital economy jobs

Healthy Communities

Globally Competitive Producers

True North

Bringing the kids back home



Bringing health to rural seniors

