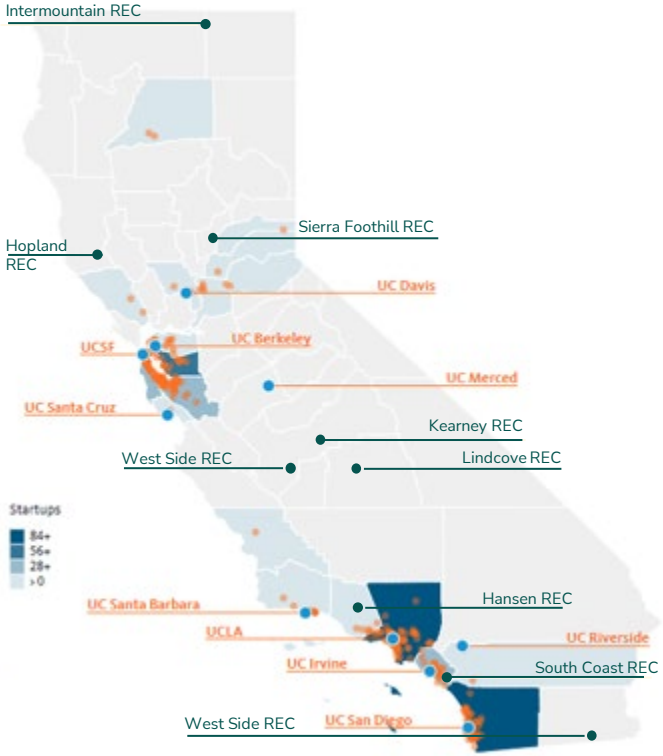
Innovation 4.0

New:
Challenges
Tech
Approach

The University of California System

Land Grant Innovation Powerhouse



9
Field Research Centers (RECs)

60+
Field Offices Statewide

1200+
Annual Research Projects

12k+
Active Inventions in the UC System

5k+
Startups across verticals & funding stages

$8B
Annual research funding

3
National Labs

10
Campuses

5
Medical Centers

230K
Faculty / Staff

280k
Students

2M
Living Alumni

UC ANR Has Been Innovating for 100 Years

University of California
Agriculture and Natural Resources

Our world is changing



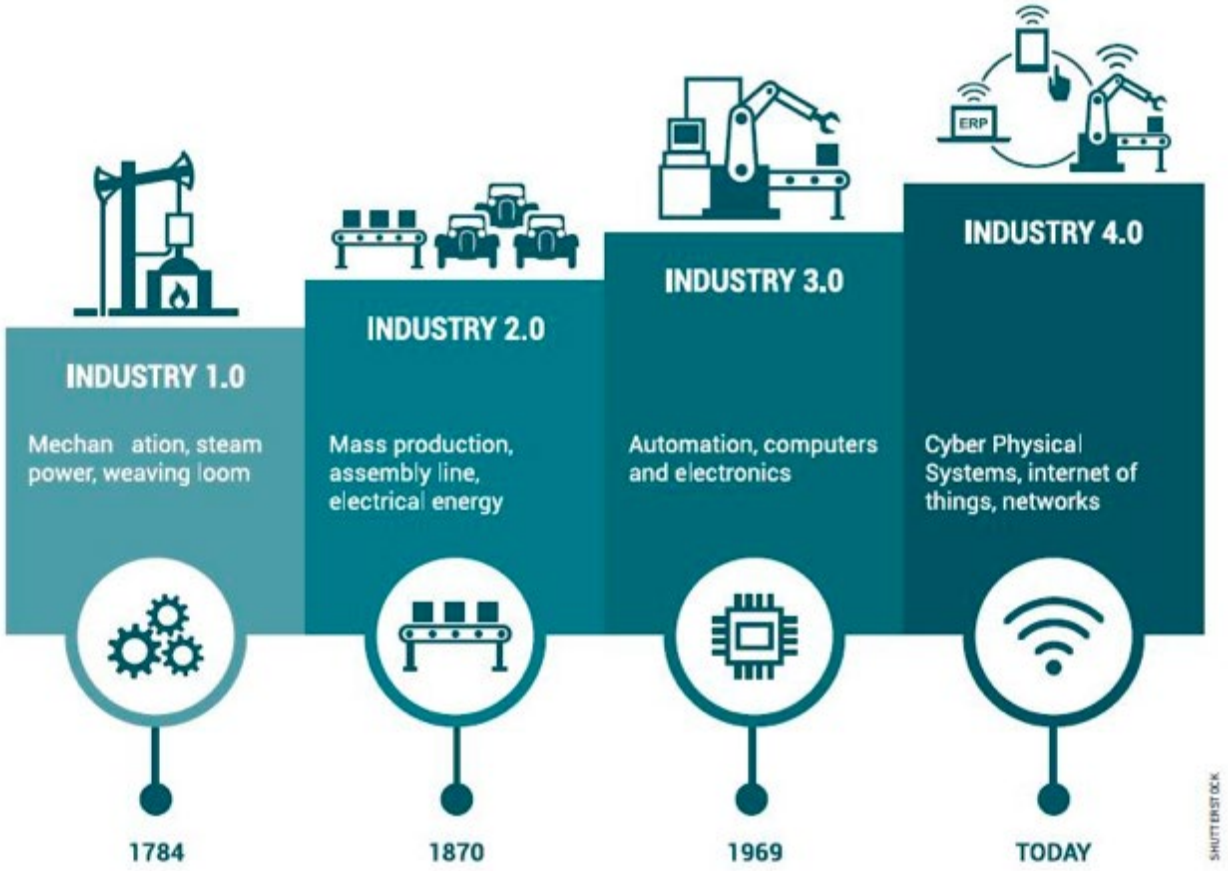
- The FAO estimates that we will need to produce sixty percent more food by 2050 to feed a world population of 9.3 billion.
- We must improve the nutritional value of food to address poor diets and chronic illness plaguing a large part of the world's population.
- Agriculture and food processing must become sustainable and regenerative to address resource depletion, pollution and climate change.

Critical Challenges Driving Technology Adoption

Labor
Regulatory Compliance
Water
Pest & Disease Management
Food Safety
Market Competitiveness

Producer: Does it save me time, money, headaches or bring profit?

Industry 4.0 is Digitized and Automated



Food is Undergoing a Revolution

Food 1.0
19th Century

- Basic Food Safety
- Industrialization of Product Manufacturing
- Industrialization of Agriculture

Food 2.0
20th Century

- Basic nutrition
- Shelf-life extension
- Globalization of brands
- Globalization of supply chains
- Globalization of disease
- Calorie security but NOT nutrition security

Food 3.0
21st Century

- Precision nutrition: food-for-health
- Safe and clean food ingredients
- Supply chain integrity & traceability
- Sustainable agricultural production
- Caloric & nutritional security
- Decreased food waste
- Changing consumer preferences

Courtesy of The March Fund

Agriculture, Food, and Health Converge

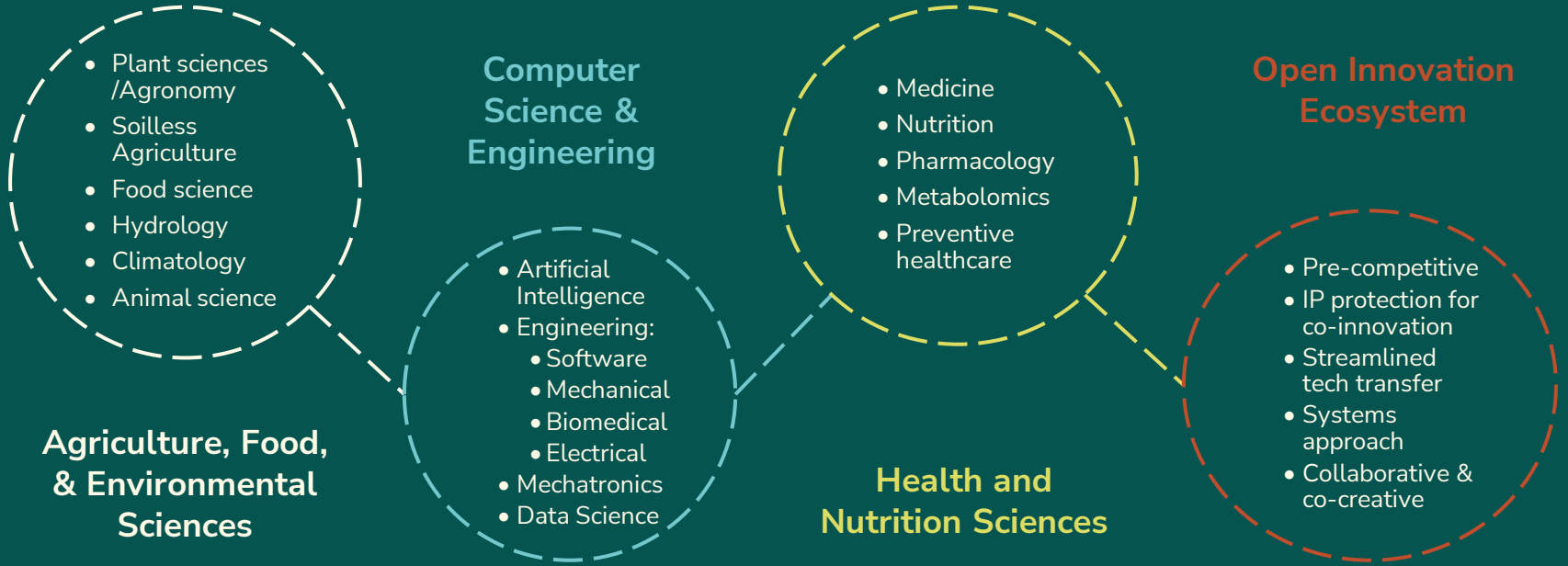
Enabling technologies of data science (AI) and molecular biology (omics) drive innovation

Health and nutrition drive future agriculture and food

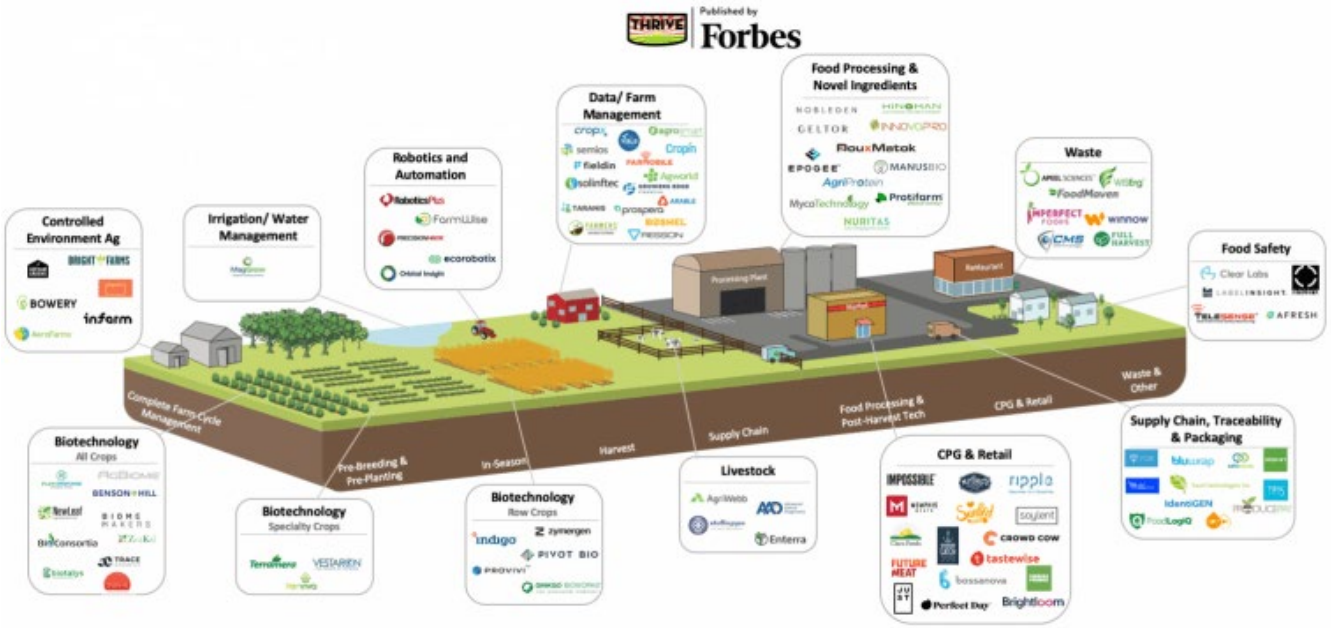
Sustainable new crops drive profitable new ingredient and food markets

New fresh and prepared food products drive improved health and less waste

Ag + Food + Health + Tech + Innovation



The AgTech industry is growing



Key Areas
Inputs/Crop Health
Automation
Big Data
Supply Chain
Animal health & monitoring
Genomics
FinTech
FoodTech (e.g. Alt Proteins)

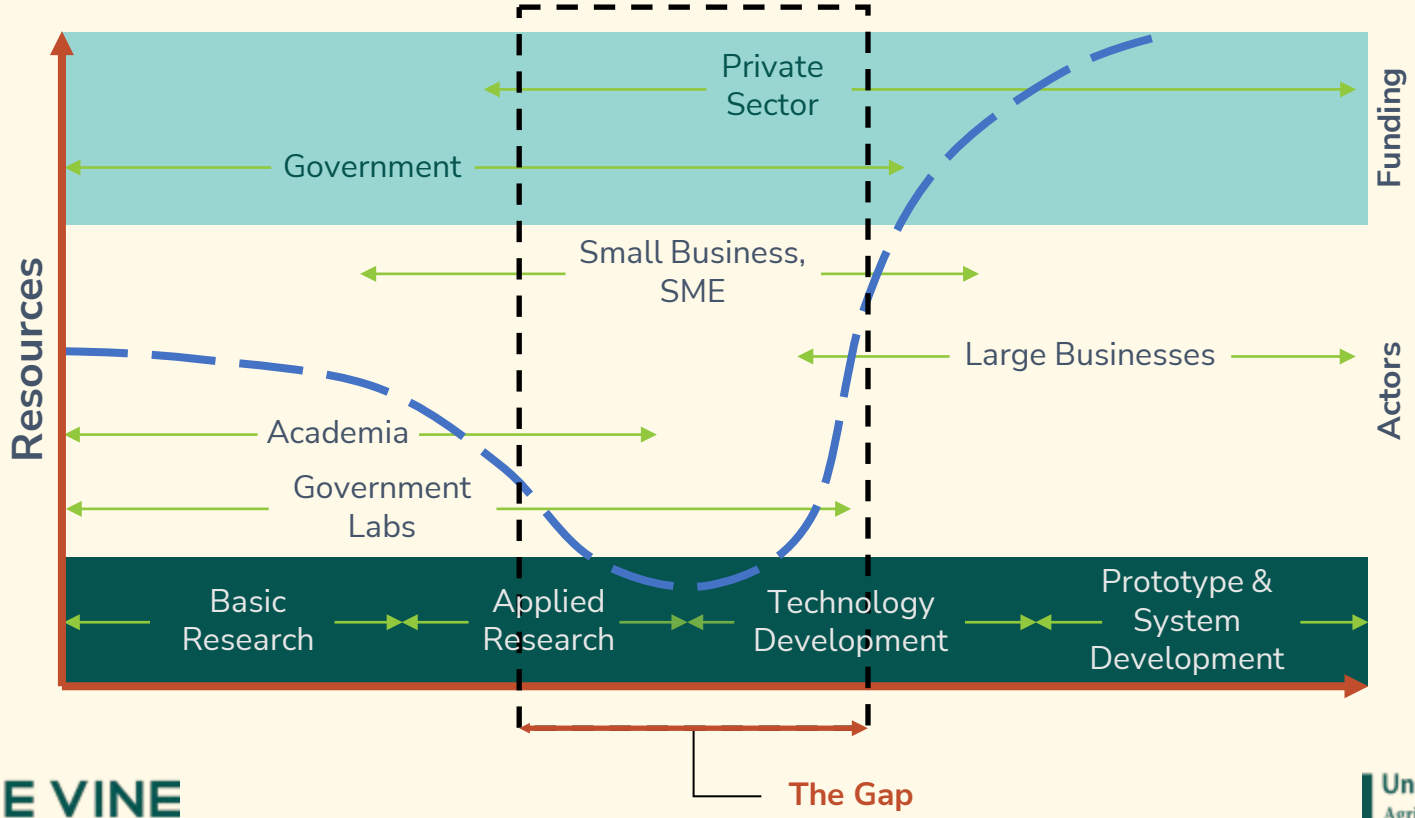
Led by
Genomics
AI
IoT
Big data
Cloud computing

2020: $13.8 billion ⟶ 2025: $22 billion

Challenges of “AgTech”

- Silicon Valley tech push to ag
- Industry turning to startups
- Promising but complex solutions
- Ag industry overwhelmed
- Difficult path to market
- Shrinking UC ANR footprint
- $1.5B in 2017 to $10.5B in 2021

The AgTech “Valley of Death”



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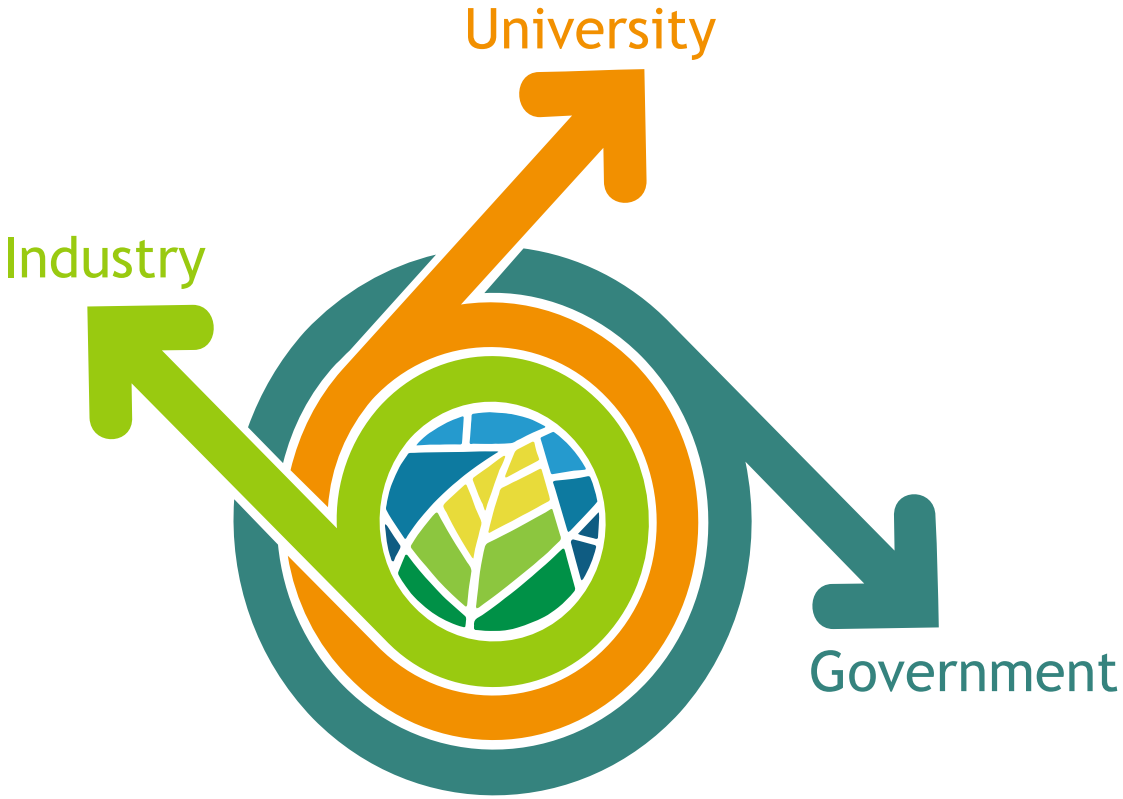
Innovation 4.0 Requires Shared Values and Purpose



Leverages Proven Models

Global

- SEMATECH
- Fraunhofer
- BRAINPORT EINDHOVEN

UC

- Berkeley SKYDECK
- CITRIS THE BANATAO INSTITUTE
- qb3 ucb·ucsc·ucsf

Research, Commercialization, Workforce & Economic Development Work Together

Commercialization

AgStart

THRIVE by SVG VENTURES

Fresno State Water, Energy and Technology Center

Berkeley SkyDeck

ChicostArt

The VIC Center for Innovation & Technology

Global:SF

Bakar BioEnginuity Hub

The Mixing Bowl Connecting Innovators in Food, Ag & IT

qb3

California Biomanufacturing Center

Economic Development

Central Valley AgPLUS Food and Beverage Manufacturing Consortium

BLUETECH VALLEY

UC DAVIS University of California

Global:SF

Research & Development

NASA

AIFS

West Hills College

ABPDU

CITRIS Banatao Institute

UC DAVIS Innovation Institute for Food and Health

UC Riverside University of California

Hartnell College

UC DAVIS University of California

RECS

9 Research and Extension Centers spanning all relevant climate zones

UC CE

178 Cooperative Extension Researchers and Farm Advisors in 57 counties across the state

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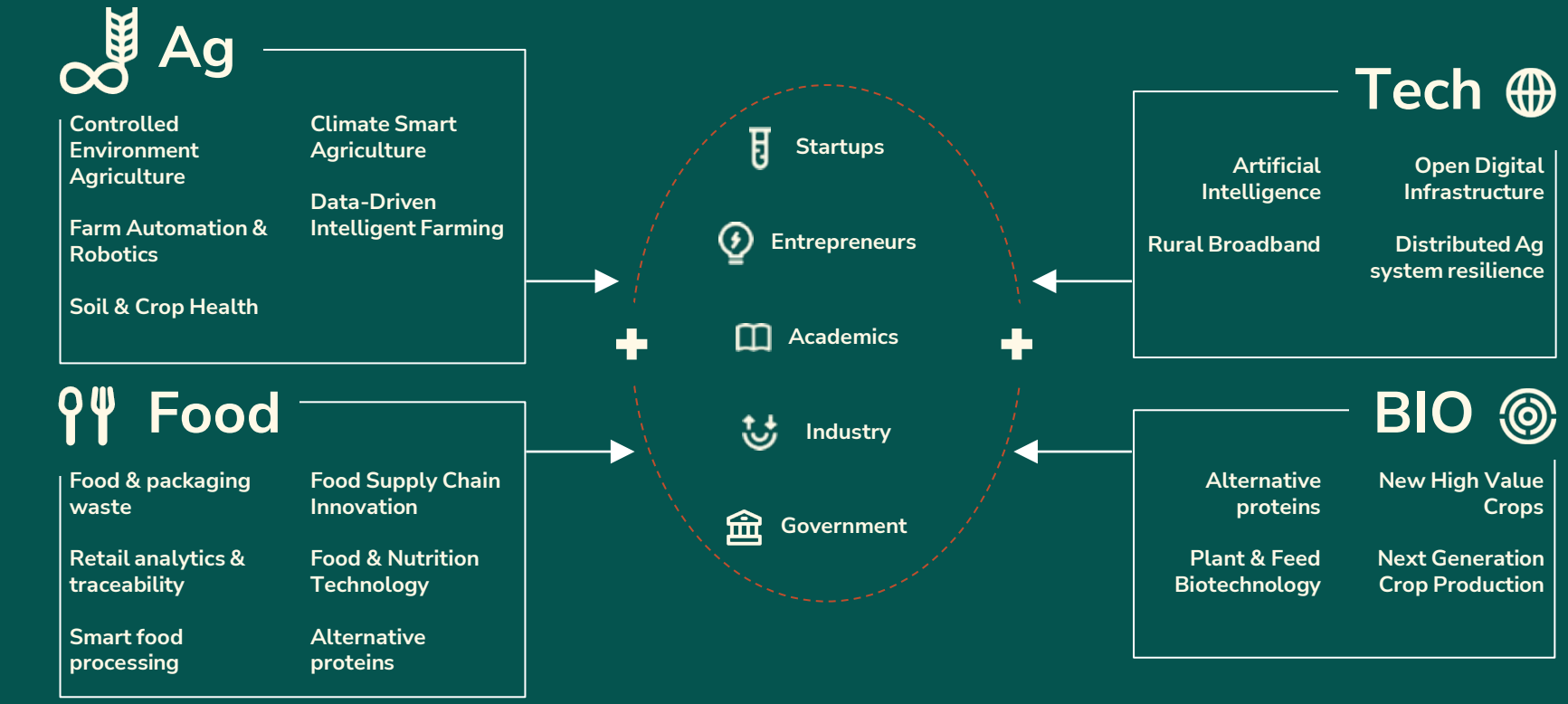
Cross-Cutting Themes:



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The VINE's Mission

We identify, commercialize, and scale science and technology breakthroughs that drive the sustainable future of our health and our planet

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Connect

- Industry navigation across ag, food, bio, tech
- UC ANR researchers & field locations
- University & college experts, students, resources, incubators, accelerators
- Investors
- Grants & funding opportunities
- NGOs & public programs

THE VINE

Build

Open innovation consortia

Inter-disciplinary use inspired research

International collaboration

Technology development support for entrepreneurs

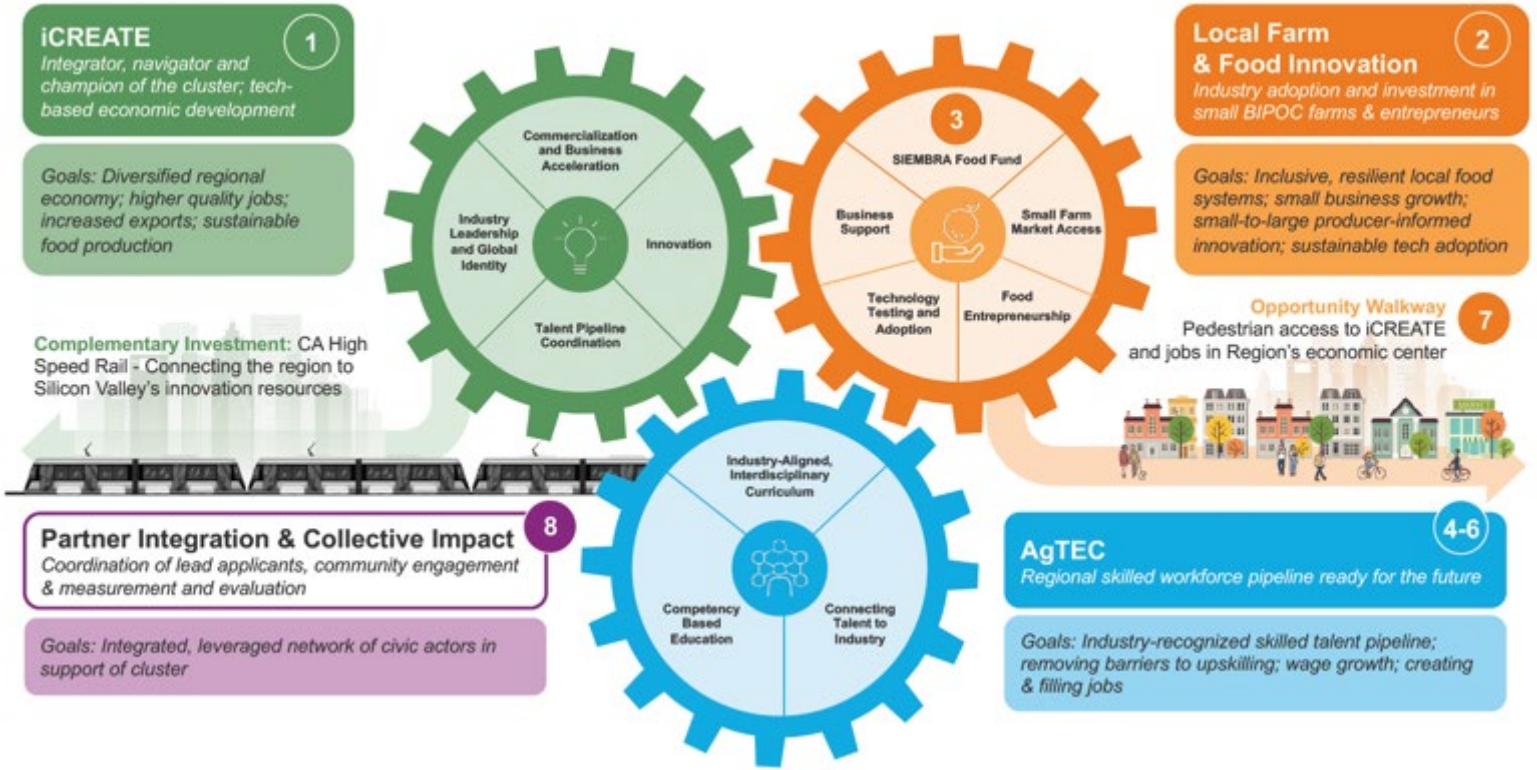
Grow

Focused events on specific topics

Deep science and technology facilities for startup technology development and industry/academic collaboration

Build regional capacity to drive innovation to advance technology, develop the workforce and create a thriving economy

Fresno- Merced Future o Food (F3) Innovation



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Key Takeaways

1. Industry 4.0 brings technology, Innovation 4.0 must focus on adoption

2. Aligning priorities is key for industry, academic and government collaboration

3. Inclusive innovation co-develops solutions with affected industries, workforce, communities

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Thank You