



DART

DRONE AUTOMATION & ROBOTICS TECHNOLOGIES

&

STARTUP
MONTEREY BAY
CONNECT



2024 OUTLOOK FROM REGIONAL INDUSTRIES • TUESDAY, JANUARY 9 @6PM | ONLINE



AG & AG-TECH



HEALTH



HOSPITALITY



ENERGY



ELECTRICAL AERIAL RIDESHARING

SPONSORED BY  **The James Irvine Foundation**



Walt Duflock
VP, Innovation
Western Growers

&



SPECIALTY CROP AG CHALLENGES CREATE AGTECH OPPORTUNITIES

- Crop and Soil Health – pests and pathogens
 - 20-40% of crops lost to pests (\$220B disease and \$70B pests), massive regulatory pressure on chemicals and reduced efficacy
 - Chemical inputs – usage limits, bans, fines (EU, US, CA)
- Labor – costs increasing, harder to find, global problem
 - 8x regulatory cost in 12 years (\$109 to \$977/acre/yr)
 - 7x lift in H-2A workers in 17 years (48k to 371k – 15% of total) – includes housing and transportation (FLC)



**10 years
of global
agrifoodtech**

\$29.6 billion
raised globally in 2022

\$196 billion
total raised globally
since 2012

Global agrifoodtech investment by year



Farm tech spotlight

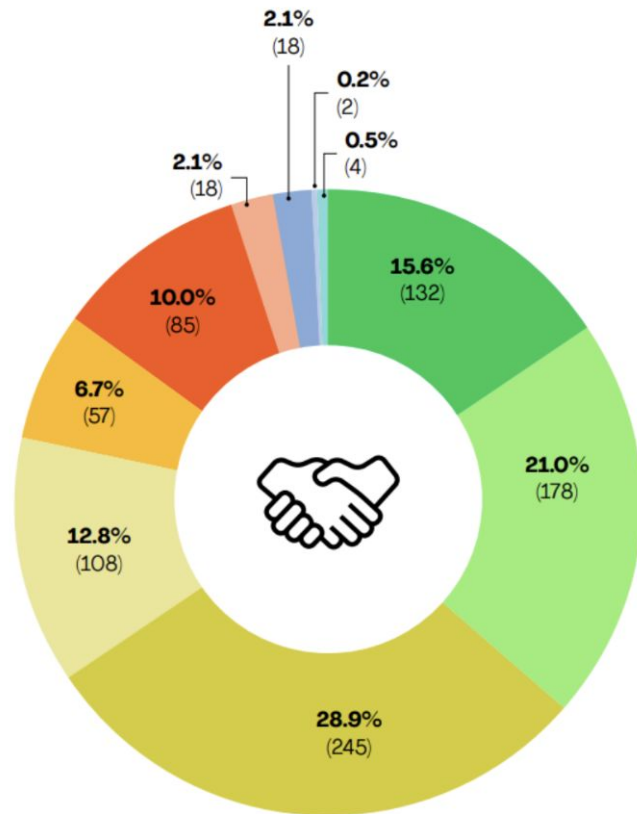
investment by
category 2022

\$10.2 billion
raised globally through
Farm tech 2022

2022 Farmtech investment by category

Biotech #2 (#1 for next 3-5 years)
Automation #6 (#3-4 in 2024)

Stream	Category	\$ USD
	Novel Farming Systems	2.8b
	Ag Biotechnology	2.4b
	Farm Mgmt SW, Sensing & IoT	1.7b
	Ag Marketplaces & Fintech	1.0b
	Bioenergy & Biomaterials	814m
	Farm Robotics, Mechanization & Other Farm Eq	709m
	Farm-to-Consumer eGrocery	466m
	Midstream Technologies	157m
	Miscellaneous	107m
	Home & Cooking	18m



2023 AG BIOLOGICALS LANDSCAPE

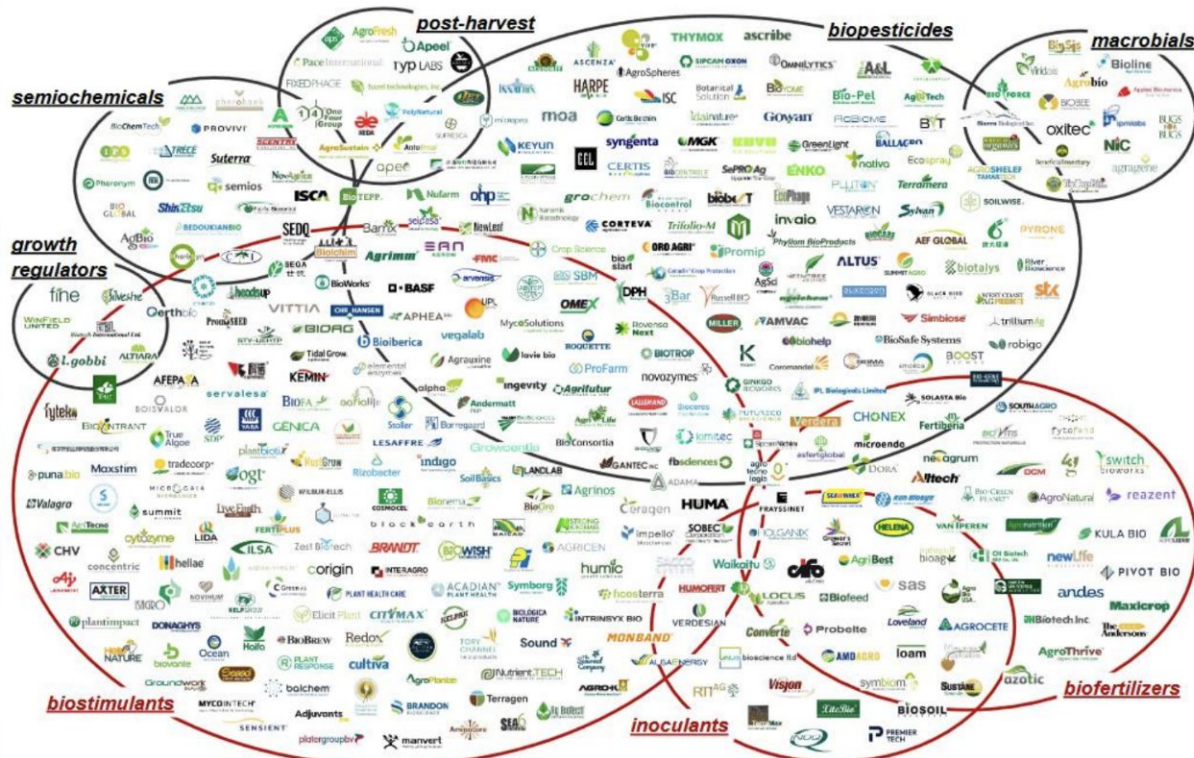
The Mixing Bowl
CONNECTING INNOVATORS IN FOOD, AG & IT

BIO-BASED SUBSTANCES

LIVING ORGANISMS

BIOCONTROL

CROP & SOIL HEALTH



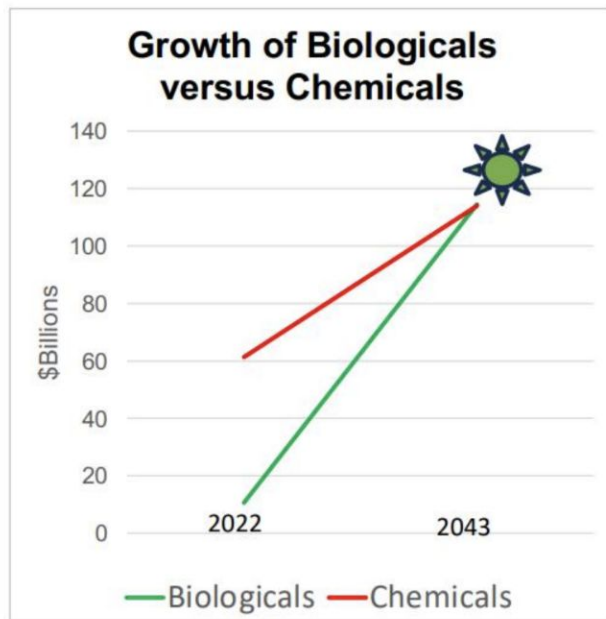
Main categories: bio-control (pesticide) and bio-stimulant (yield)

Strategic buyer (Bayer) ROI on R&D is harder than M&A and investment (and we have known IP paths and valuations)

BIOLOGY = CHEMISTRY?

- Shane Thomas ran projections and estimates that segments will be equal at \$114B in 2043
- Accelerated regulation or biological efficacy would reduce that timeframe

Biologicals Market Could Equal Chemicals in ~20 Years!



Growth rate (CAGR)	12 %
Number of periods	Biologicals 21
Initial value	10,600,000,000 \$
Final value	114,520,791,603.36 \$

Growth rate (CAGR)	3 %
Number of periods	Synthetics 21
Initial value	61,300,000,000 \$
Final value	114,036,057,245.79 \$

Source: Shane Thomas, Upstream Insights

2022 CROP ROBOTICS LANDSCAPE



	AUTONOMOUS MOVEMENT		CROP MANAGEMENT		HARVEST
ROW CROP	Navigation/ Autonomy	Large Tractor	Scouting	Drone Application	Weeding & Thinning
SPECIALTY FIELD					Specialty Field Harvesting
ORCHARD-VINEYARD					Orchard-Vineyard Harvesting
INDOOR					Indoor Harvesting

- Weeding, thinning, planting, harvest assist – entries gaining traction with economics that work for the grower
- Harvest – hardest automation problem to solve
- AI will leverage massive data sets from equipment to deliver actionable recommendations for what to plant, when to plant, and when to apply inputs