

Central Coast Ag Tech Program

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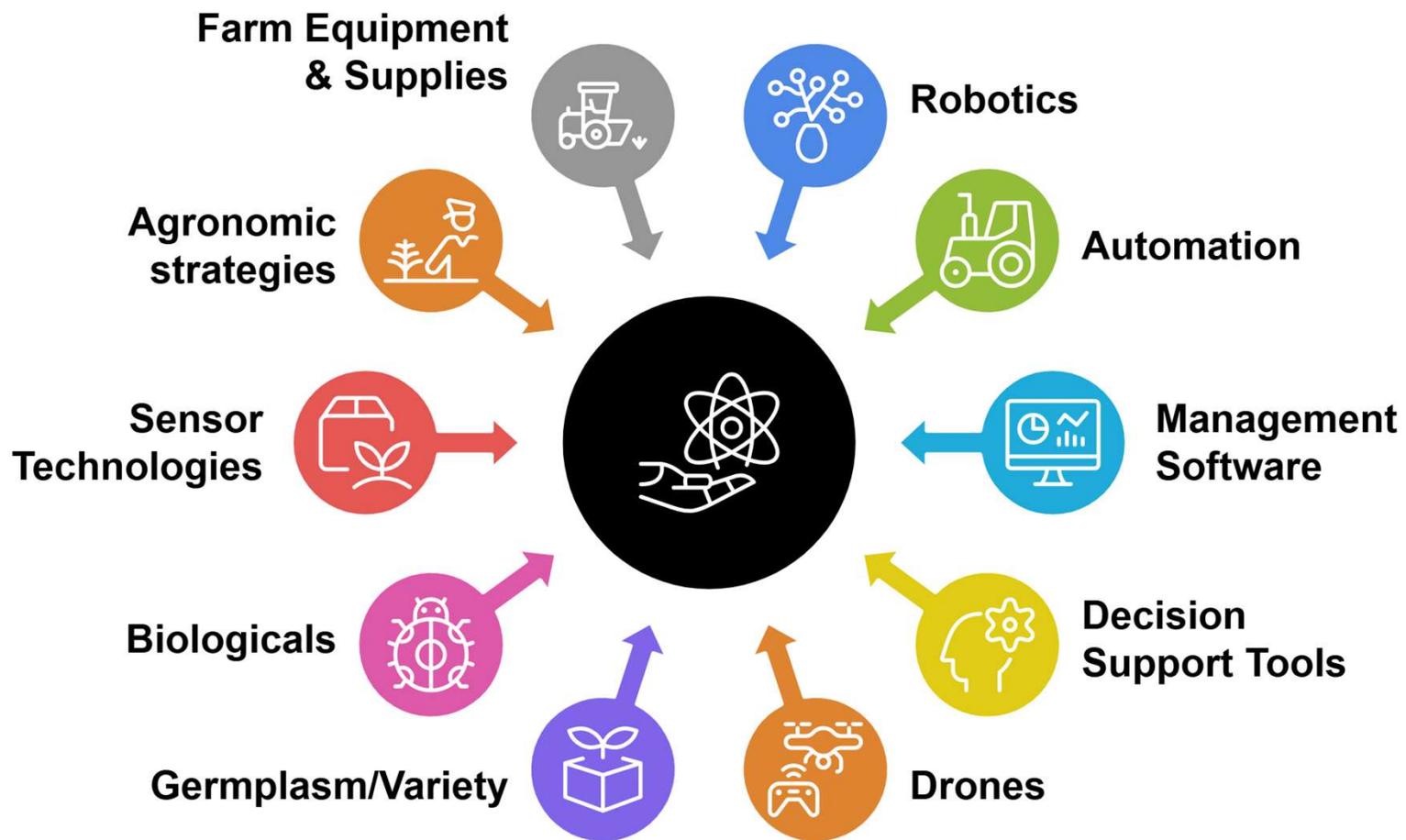


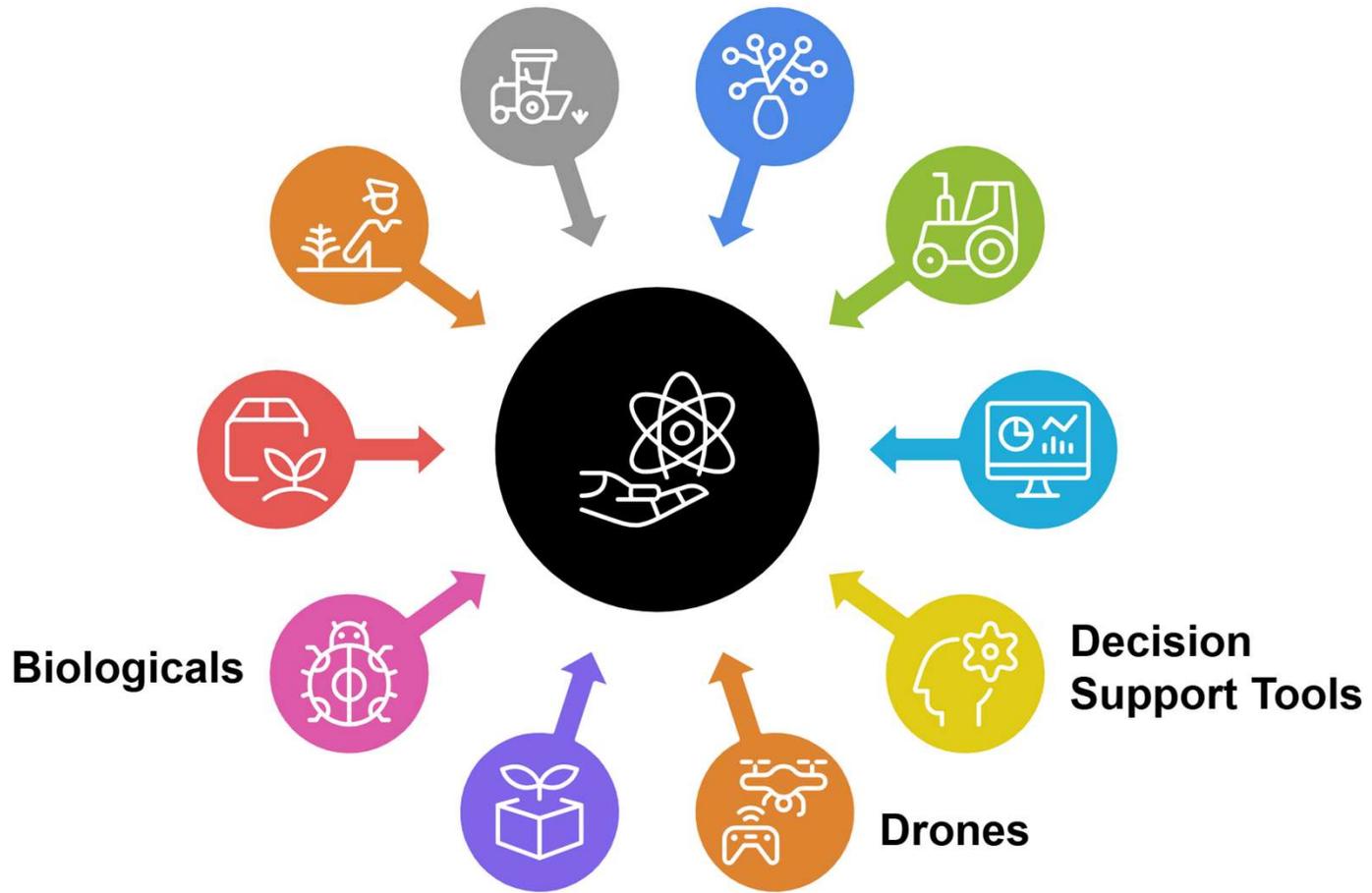
Today's Roadmap

- **Ag Tech, a broad term**
- Why these **three focus areas**
- Biological chemistries
 - ❖ Evaluation & trials
- Drone spray technology
 - ❖ Performance & use cases
- Decision support tools
 - ❖ ROI & UC-developed tools
- What's next & how to stay involved

Practical, grower-driven focus



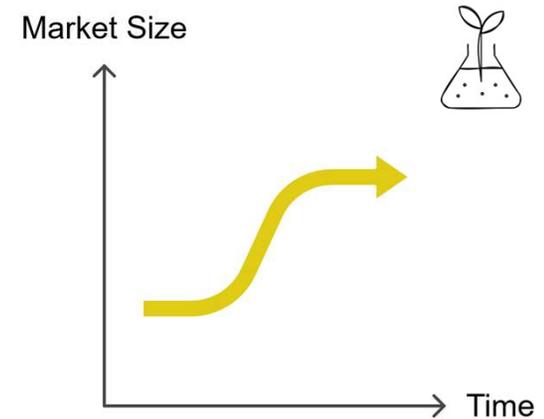
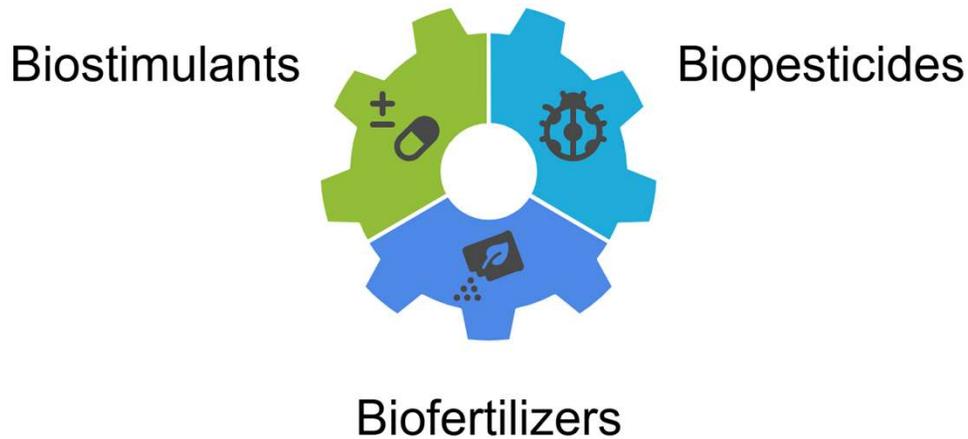




Sorting the Science from the Noise: Biologicals Evaluation Initiative

The push to find solutions to reduce the use of synthetic inputs has led to a movement towards biologicals.

Agricultural Biologicals Market Size to be worth \$24.6 Billion by 2027. (MarketsandMarkets™)



Agricultural Biologicals Market Growth

Sorting the Science from the Noise: Biologicals Evaluation Initiative

What did you test last year?

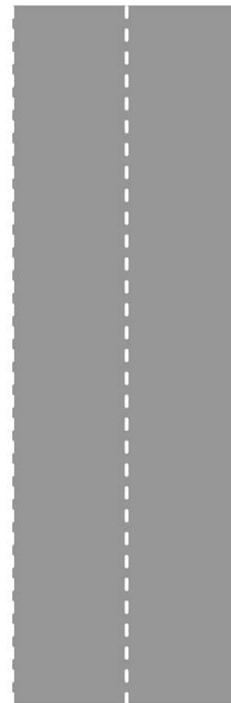
We tested eight biological products in lettuce with Huntington Farms.

What did you track?

We tracked crop response and field performance.

What will you do next?

I'm putting together a blog post with the key takeaways and what I'd change for next time.



Screening

Initial selection of promising products



Evaluation

Testing products in controlled environments



Validation

Confirming product performance in real-world settings

Drone Spray Optimization for Leafy Greens

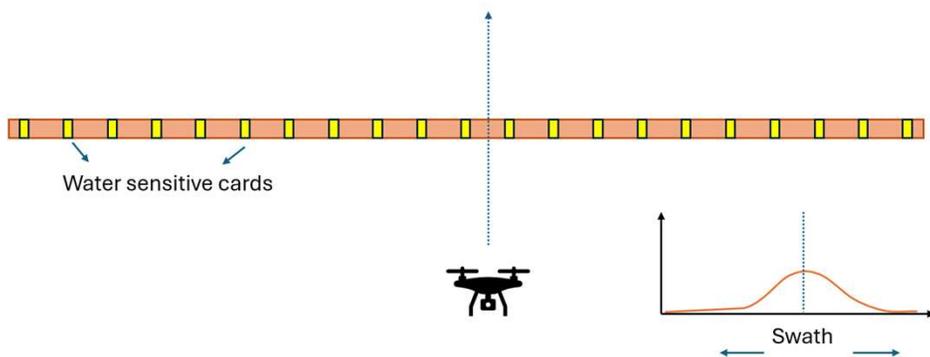


- Where does it fit?
- What problem does it solve?
- What does ‘good application’ actually look like in our local conditions?”

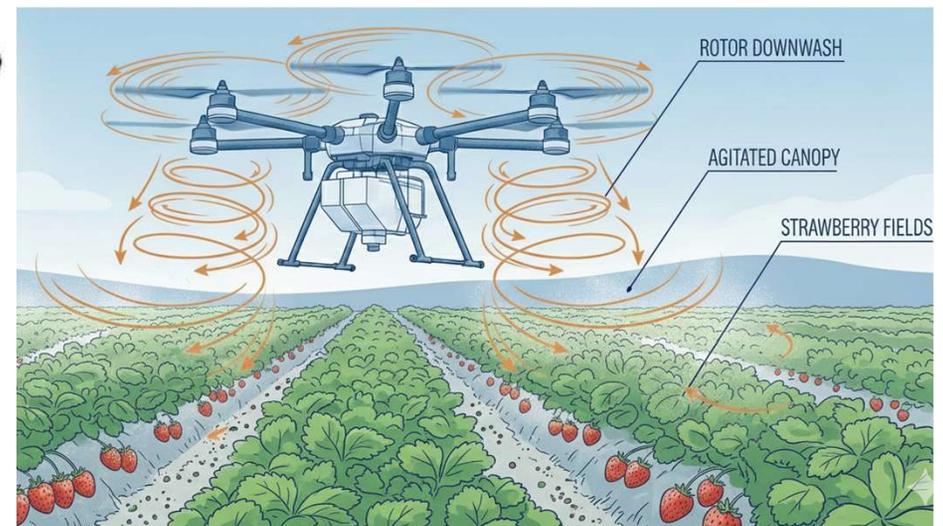
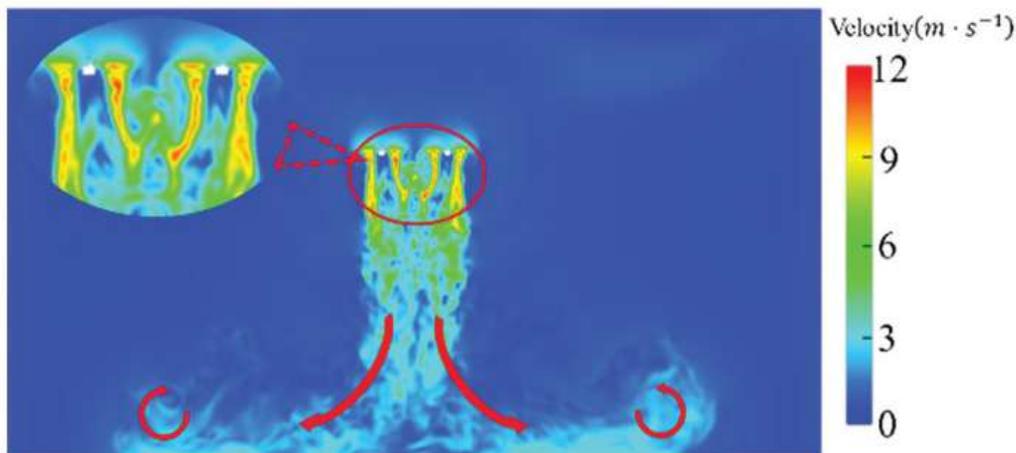
Drone Spray Optimization for Leafy Greens



Treatments	Levels
Ground speed (S)	10 and 12 mph
Elevation (E)	10 and 14 ft
Rate (R)	3, 5, and 10 gpa



Drone Spray Optimization for Leafy Greens



Generated by Gemini

Chang, K., Chen, S., Wang, M., Xue, X., & Lan, Y. (2023). Numerical simulation and verification of rotor downwash flow field of plant protection UAV at different rotor speeds. *Frontiers in Plant Science*, 13, 1087636.

Keeping Kerb® Where It Works via

Kerb® SC

Key to pre-emergent weed control in California lettuce, yet performance often declines when heavy germination irrigations move the active ingredient below the weed-seed zone.



Drone Technology: Evolution to Regulations



FCC Covered List Update: Two Temporary Exceptions for Drone Supply in 2026

January 12, 2026

By Paramveer Singh

REMOTE OPERATIONS

Supervised Drone Flights for Continuous Bird Mitigation

Decision Support Tools

[Smart Spray Annual ROI Calculator MSU](#)

Summary Results

Annual Savings \$59,866.67	ROI (%) 79.8%
Payback Period (Years) 1.3 years	Overall Chemical Reduction (%) 80.0%

[Smart Spray ROI Calculator](#)

Include depreciation (annual ownership cost) ?

Expected machine life (years) ?

7 - +

Summary Results

Annual Savings \$18,357	ROI (%) 15.3
Payback Period (Years) 6.5	Overall Chemical Reduction (%) 80.0

Decision Support Tools



Leaf Monitor



When2Fly?



GDD Calculator



Leaf Spectral Predictor

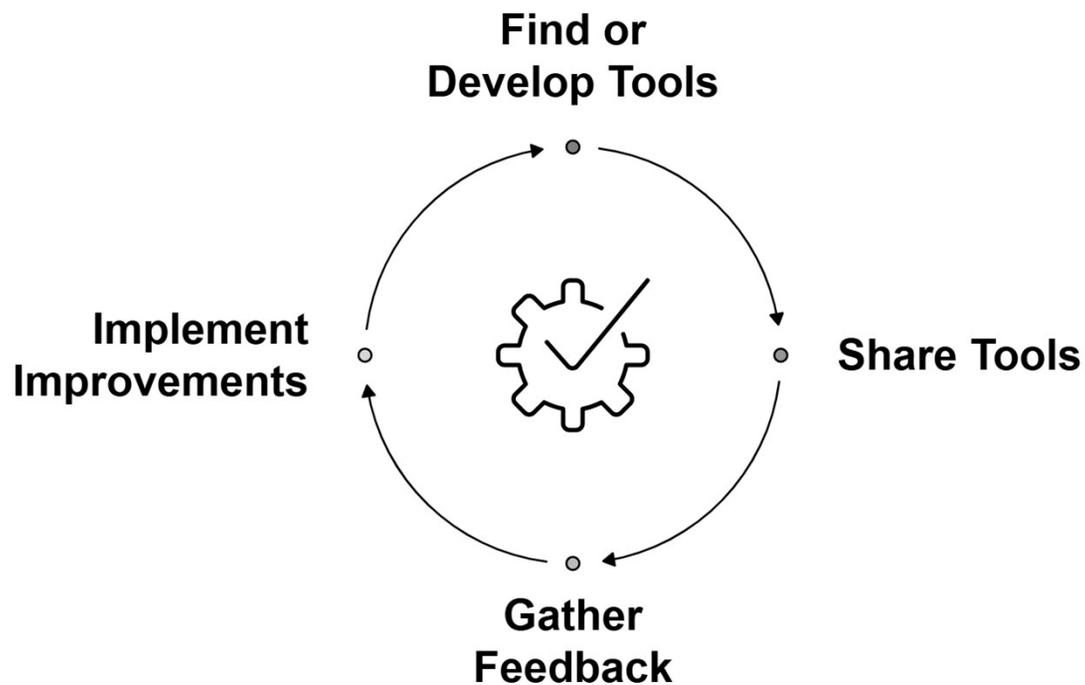
The Digital Agriculture Lab (DAL) at Department of Biological & Agricultural Engineering. Led by Dr. Alireza Pourreza

Growing Degree Day Calculator

Weather & Growing Degree Days Analysis



Decision Support Tools



- Where to find them
- How to use them
- What assumptions mean
- Feedback for improvements

Central Coast Ag Tech Program

Extension and outreach

Demonstration Field Days



Educational workshops

Artificial Intelligence (AI) for Sustainable Agriculture Workshop

November 6, 2024 By Paramveer Singh, Michael D Cahn

Pest Management & Plant Health Agriculture

When: December 3rd, 2024

Posts at UCANR Salinas Valley Blog

Article

Navigating CARB's Advanced Clean Fleet Regulation: What Growers Need to Know

December 6, 2023 By Michael D Cahn

Print

Agriculture

California Agriculture Takes Flight: A Guide to Drone Spray Pilot Certification

May 29, 2025 By Paramveer Singh

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Agriculture and Natural Resources

Cooperative Extension

Questions ?

