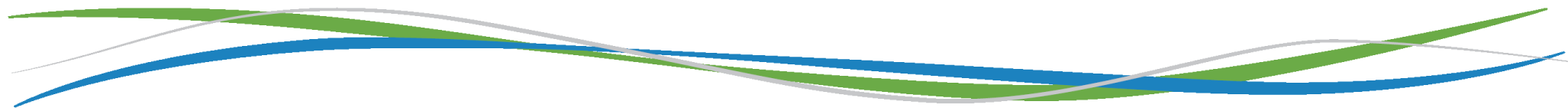


# BioAg World

## CONGRESS

*AN EVENT BY THE INDUSTRY, FOR THE INDUSTRY*





# Early-Adopters of Ag Technology & Innovation

Stuart Woolf  
President & CEO  
Woolf Farming & Processing





**Stuart Woolf** is President and CEO of Woolf Farming & Processing (WF&P). WF&P also has interests in Harris Woolf Almonds, Los Gatos Tomato Products and an irrigation business called Cal West Rain. He did his undergraduate studies at the University of California at Berkeley and received an MBA from Boston College. Mr. Woolf has served as Chairman of the California League of Food Processors, the Almond Board of California, and of the UC President's Commission of Agriculture and Natural Resources. He currently serves on the board of the California Chamber of Commerce, Western Growers Association and Marrone Bio Innovations.



**Mission:** To pass our family business from one generation to the next in bigger and better shape than it was received.

**Vision:** To build a resilient agribusiness focused on competitive advantage, risk management, early-stage adoption of new technology & sustainable farming practices.







# Its Easy to Find New Technology & Innovation for the Farm. What's Hard is Choosing





# Woolf Farming

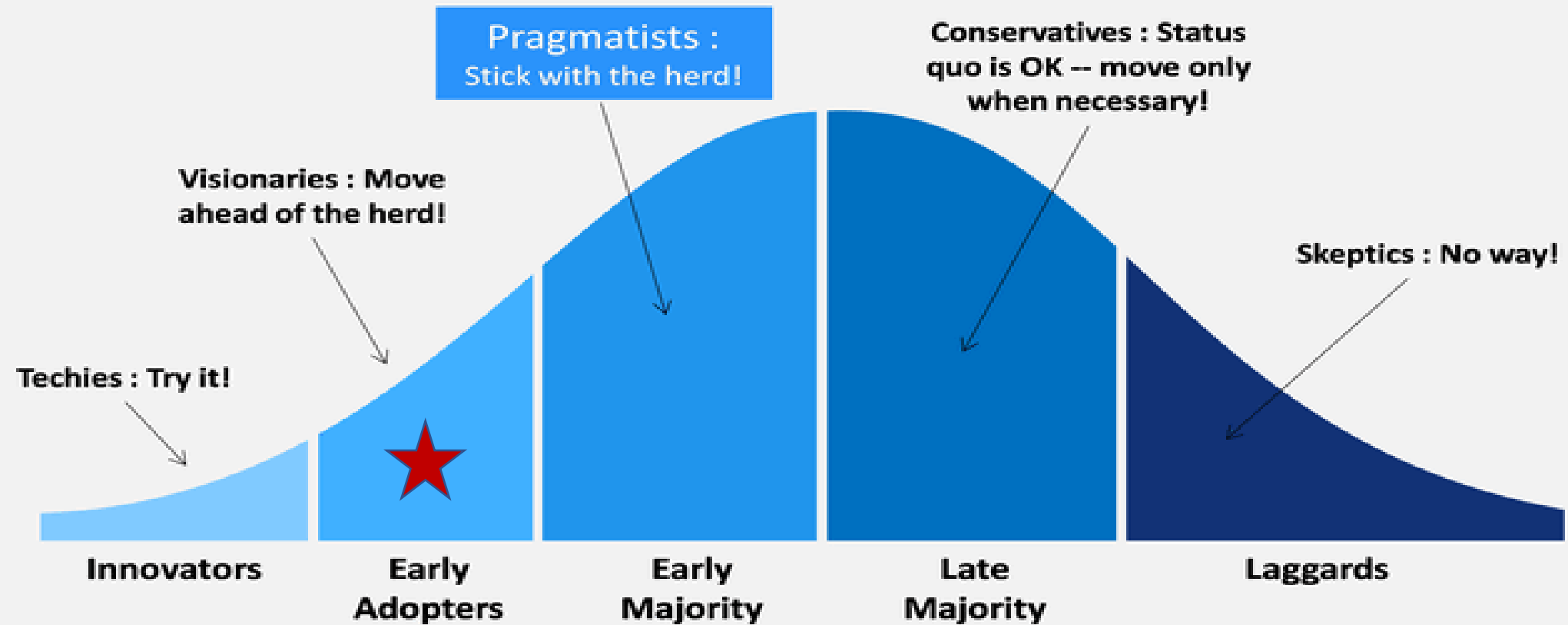
- **Founded in 1974 by Jack Woolf**
- **FARMING:** Almonds, Processing Tomatoes, Wine Grapes, various row crops
- **PROCESSING:** Almonds, Tomato Paste
- **OTHER:** Past & Present: Roses, Frozen Vegetables, Well and Irrigation services
- **MISSION:** To pass it on in bigger and better shape than it was received
- **STRATEGY:** Focus on crops with competitive advantage, shelf stable, highly mechanized and nutritionally dense.
- **PRODUCING MORE WITH LESS**





# TECHNOLOGY ADOPTION LIFE CYCLE

Enter Your Sub Headline Here







# Consider the Impact of being early-adopters in the tomato industry...



## In the 70's

- Budgeting by Crop
- Furrow Irrigation
- Mostly, low value commodity crops
- Land leveling
- Multiple bed types
- Lots of hand labor
- Terrible early-stage mechanical harvesters

## By the 90's

- Budgeting by Field
- 100% drip/micro sprinklers
- Specialty Crops: Almonds, pistachios & wine grapes
- Uniform bed types, fewer tractor passes, GPS, less material & labor.
- Electronics/Mechanical Harvesting
- Better Varieties.



## Results: Enjoyed Competitive Yield & Cost Advantages for Decades

We're producing three times the tons with less nitrogen & water

We've eliminated over 1 MM Gallons of Diesel per year in hauling

We've dramatically reduced our diesel burn in the field with buried drip and uniform beds

Nox emissions from our NG boilers are less than 5% what they were prior to being regulated into the 90's







## Challenges:

Salt concentration with drip

Distribution Uniformity

Genetics: GMO & CRISPR

Labor Availability & Cost

Water, materials, regulations

# Current...



## Opportunities:

Imagery (yield monitors w/ maps)

Improved varieties/better solids

More Analytics: [Irrigation Biz](#), [DU](#)

Mechanization/Robotics

Biologics: Softer Materials

Regenerative Ag





# How to Choose...

- 1) What Tech/innovation can move the needle the most?
- 2) Do they align with our customer's desires?
- 3) Which companies should we work with?
- 4) Will the data/information integrate well with our existing platforms?
- 5) Do we believe in the benefits/payback? When do we pull the plug?
- 6) Do we even need a payback? BIOLOGICALS/REGEN AG



# Our Long-Term Perspectives:



- We won't see the run up in farm productivity (In most of CA) in the next 40 years as we have seen in the past 40 years.
- Most of the high-tech startups around today won't make it
- We will require less water, materials, labor and energy in the food chain.
- Innovation, while driving productivity will also drive consolidation
- The Food Chain will be vastly more transparent to all...including Gov't
- Food Quality & Safety will Improve
- Global Food Production will follow water, labor and land.
- We'll have to Embrace Genetic Engineering (GMO)/Editing (CRISPR) to drive Productivity on less land with fewer natural resources



# Thoughts about our Future at Woolf Farming

- What to do with our fallow lands
  - Large Scale Solar
  - Water Banking
  - Drought Tolerant Crops (Secret Plan!)
- Mechanization
- Reducing fossil fuels. Electric Vehicles, wells & boosters/ Biomass
- Our Own Micro-grid
- Yield Maps & Water Use Efficiency
- Regenerative Ag Practices



# Likely Outcomes for CA Ag: Next 20 years

- Fewer Farmers: Big will get Bigger. Squeeze in the middle
- Fewer Acres: From 8.5MM to 7-7.5MM
- Less Diversity. More Permanent Crops/Fewer Row Crops/More land Fallowed, Fewer Dairies.
- Higher Farm Revenue/Shrinking Gross Margin due to Higher Costs
- Continued improvements in yield/cost w/ better Tech/Innovation
- The Pursuit of Growth Outside of CA
- Crops shifting from South to North & More Organics
- More Renewable Energy/Regenerative Ag



# WOOLFARMING



# AND PROCESSING

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