The Evolution of Farming

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Director of Farming, Burford Ranch

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My Personal Story

- I grew up on the family farm where I now currently work
- Growing up I looked up to my dad who was and continues to be General Manager of the company
  - Immigrant from Nayarit, Mexico
  - Story of perseverance and grit (no formal education, high work ethic, pride)
- Fresno State Ag Business 2008, MBA in 2015
- Various community and industry boards
- Ag Leadership

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Learning Objectives

- 1. Identify two challenges for today's farmers along the food processing channel that impact production
- 2. Identify active solutions that are occurring along the food processing channel that food and nutrition professionals can offer when engaging with consumers
- 3. Identify one actionable strategy food and nutrition professionals can incorporate to build and maintain sustainable partnerships with farmers.

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Fresno County and the San Joaquin Valley

- "Fresno County is home to 1.88 million acres of the world's most productive farmland, with agricultural operations covering nearly half of the county's entire land base of 3.84 million acres. Farmers here raise more than 300 different crops, contributing directly more than $7.98 billion to the California economy and supporting 20 percent of all jobs in the Fresno area. Many of the county's crops are not grown commercially anywhere else in the nation." (FCFB)

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Fresno County Farm Bureau
Serving agriculture since 1917
Fresno County Harvest Calendar
JANUARY
Broccoli
Citrus
Grapefruit
Lemons
Oranges
Pummelos
Tangelos
Tangerines
FEBRUARY
Broccoli
Citrus
Lemons
Oranges
Tangelos
Tangerines
MARCH
Asparagus
Broccoli
Citrus
Lemons
Mandarins
Oranges
Tangelos
Tangerines
Lettuce
APRIL
Asparagus
Broccoli
Citrus
Oranges
Lettuce
Peas
Strawberries
Wheat
MAY
Alfalfa
Asparagus
Blueberries
Cherries
Citrus
Oranges
Cucumbers
Green Beans
Nectarines
Onions
Peaches
Peas
Plums
Squash
Strawberries
Wheat
JUNE
Alfalfa
Apricots
Asparagus
Barley
Bell Peppers
Blueberries
Boysenberries
Cherries
Chili Peppers
Citrus
Oranges
Corn
Cucumbers
Eggplant
Grapes
Green Beans
Nectarines
Onions
Peaches
Peas
Plums
Squash
Strawberries
Tomatoes
Wheat
JULY
Alfalfa
Apricots
Apriums
Barley
Bell Peppers
Blueberries
Cantaloupes
Chili Peppers
Citrus
Oranges
Corn
Cucumbers
Eggplant
Figs
Garbanzo Beans
Grapes
Green Beans
Honeydew
Nectarines
Onions
Peaches
Pears
Peas
Plums
Pluots
Safflower
Squash
Strawberries
Tomatoes
Watermelons
Wheat
AUGUST
Alfalfa
Almonds
Apples
Apriums
Barley
Bell Peppers
Cantaloupes
Carrots
Chili Peppers
Corn
Cucumbers
Eggplant
Figs
Garbanzo Beans
Garlic
Grapes
Green Beans
Honeydew
Jujubes
Lettuce
Nectarines
Onions
Peaches
Pears
Plums
Pluots
Safflower
Squash
Strawberries
Sunflower
Tomatoes
Watermelons
Wheat
SEPTEMBER
Alfalfa
Apples
Barley
Bell Peppers
Cantaloupes
Carrots
Chili Peppers
Corn
Cucumbers
Eggplant
Figs
Garlic
Grapes
Green Beans
Honeydew
Jujubes
Lettuce
Nectarines
Onions
Peaches
Pistachios
Plums
Pumpkins
Rice
Sorghum
Squash
Strawberries
Tomatoes
Walnuts
Watermelons
Wheat
OCTOBER
Alfalfa
Apples
Barley
Bell Peppers
Broccoli
Cantaloupes
Chili Peppers
Corn
Cotton
Eggplant
Grapes
Green Beans
Kiwi
Lettuce
Persimmon
Pistachios
Pomegranate
Pumpkins
Rice
Sorghum
Squash
Tomatoes
Walnuts
Watermelons
Wheat
NOVEMBER
Alfalfa
Bell Peppers
Broccoli
Citrus
Lemons
Oranges
Cotton
Eggplant
Grapes
Green Beans
Kiwi
Long Beans
Olives
Persimmon
Pistachios
Pomegranate
Squash
Tomatoes
Walnuts
DECEMBER
Broccoli
Citrus
Grapefruit
Lemons
Oranges
Cotton
Olives
Pomegranate
Turnips
HARVESTED YEAR-ROUND
Cattle and Calves
Eggs
Hogs and Pigs
Honey
Poultry
Milk
Nursery Products
Sheep and Lambs
1274 W. Hedges Ave. • Fresno, CA 93728 • O: 559-237-0263 • F: 559-237-3396 • www.fcfb.org • info@fcfb.org
Revised 2/2016

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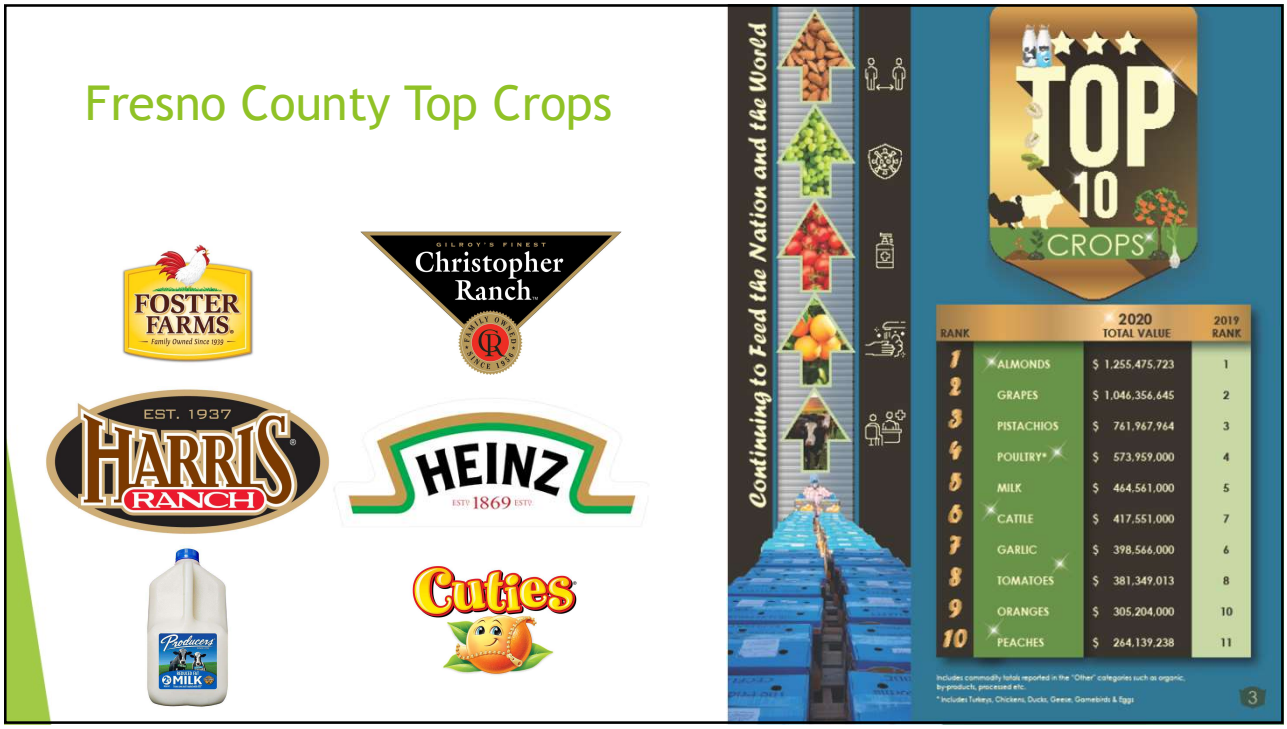
Fresno County Top Crops
FOSTER FARMS
Family Owned Since 1939
Christopher Ranch
HARRIS RANCH
EST. 1937
HEINZ
ESTD 1869
Producers
MILK
Cuties
Continuing to Feed the Nation and the World
TOP 10 CROPS
RANK
2020 TOTAL VALUE
2019 RANK
1 ALMONDS $ 1,255,475,723 1
2 GRAPES $ 1,046,356,645 2
3 PISTACHIOS $ 761,967,964 3
4 POULTRY* $ 573,959,000 4
5 MILK $ 464,561,000 5
6 CATTLE $ 417,551,000 7
7 GARLIC $ 398,566,000 6
8 TOMATOES $ 381,349,013 8
9 ORANGES $ 305,204,000 10
10 PEACHES $ 264,139,238 11
Includes commodity totals reported in the "Other" categories such as organic, by-products, processed etc.
* Includes Turkeys, Chickens, Ducks, Geese, Gamebirds & Eggs
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Why is California Agriculture so Productive?

- Geography
- Favorable Climate (Changing)
- Water System (Irrigation)
- Farmers (UC/CSU System: Top Ag Schools, Cooperative Extension, Research)
- Innovation

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Crop and Livestock Commodities in which California Leads the Nation [1]

Almonds	**Figs**	Mandarins & Mandarin Hybrids [2]	**Plums, Dried**
Apricots	Flowers, Bulbs	Melons, Cantaloupe	Pluots
Artichokes	Flowers, Cut	**Melons, Honeydew**	Pomegranates
Asparagus	Flowers, Potted Plants	Milk and Cream	Raspberries
Avocados	**Garlic**	**Nectarines**	**Rice, Sweet**
Beans, Dry Lima	**Grapes, Raisins**	Nursery, Bedding Plants	Safflower
Broccoli	Grapes, Table	Nursery Crops	Seed, Alfalfa
Brussels Sprouts	Grapes, Wine	**Olives**	Seed, Bermuda Grass
Cabbage, F.M.	Hay, Alfalfa	Onions, Dry	**Seed, Ladino Clover**
Carrots, F.M.	Herbs	Onions, Green	Seed, Vegetable and Flower
Carrots, Processing	Jojoba	Parsley	Spinach, F.M.
Cauliflower	Kale	**Peaches, Clingstone**	Strawberries
Celery	**Kiwifruit**	Peaches, Freestone	Tomatoes, Processing
Corn, Sweet	Kumquats	Peppers, Chili	Triticale
Cotton, American Pima	Lemons	Peppers, Bell	Vegetables, Greenhouse
Daikon	Lettuce, Head	Persimmons	Vegetables, Oriental
Dates	Lettuce, Leaf	Pigeons and Squabs	**Walnuts**
Eggplant	Lettuce, Romaine	**Pistachios**	Watercress
Escarole/Endive	Limes	**Plums**	

[1] *California is the sole producer (99 percent or more) of the commodities in* ***bold****.*

[2] *Includes tangelos, tangerines and tangors.*

Agricultural Statistical Overview

California Agricultural Statistics Review 2020-2021

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Food Channel Overview

- Seed production
  - Wheat, alfalfa seed, barley, triticale, garlic
  - Propagation (used for future crops)
- Feed and field crops
  - Dairies, feedlots, feed stores (meat and milk production)
  - Very important in the San Joaquin Valley
- Crops for Processing
  - Tomatoes, parsley, garlic, onions, almonds, walnuts, wine grapes
  - Non-perishable; usually turned into something different
  - Machine harvested
- Crops for direct consumption
  - Raisins, almonds, walnuts, onions, garlic, table grapes, blueberries
  - Fruits and vegetables
  - Perishable
  - Machine harvested or by hand
- Fiber Crops (not food)
  - Cotton, hemp, flax

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What determines what a farmer grows

- Climate, region, soil type (garlic)
- Access and Proximity to Market (freight, processing plants, dairies, consumers)
- Return on investment (per acre vs per acre-foot of water)
  - Water availability and cost
- Infrastructure availability (packing sheds, coolers, processing plant)

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2012 Crops

- 17,342 Total acres
- 5,700 acres Processing Tomatoes
- 3,400 acres Wheat
- 1,900 acres Almonds
- 1,700 acres Alfalfa Hay
- 1,650 acres Alfalfa Seed
- 700 acres Parsley
- 315 acres Triticale
- 255 acres Wine Grapes
- 110 acres Table Grapes
- 44 acres Blueberries
- 373 acres Raisin Grapes
- 310 acres Barley
- 960 acres Garlic

2022 Crops

- 10,468 Total acres
- 0 acres Processing Tomatoes
- 1,600 acres Wheat
- 2,900 acres Almonds
- 1,700 acres Alfalfa Hay
- 440 acres Alfalfa Seed
- 0 acres Parsley
- 0 acres Triticale
- 980 acres Wine Grapes
- 0 acres Table Grapes
- 0 acres Blueberries
- 0 acres Raisin Grapes
- 0 acres Barley
- 0 acres Garlic
- 2,100 acres Corn
- 214 acres Fresh Market Onions
- 148 acres Walnuts

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2012 vs 2022

- 13 Crops Grown vs. 8 Crops Grown
  - Movement into higher value crops (nuts, vines)
  - limited water availability
  - cost
- 50% Drip Irrigated vs 100% Drip Irrigated
- 150 Employees vs 90 Employees
- 30% decrease in water use
- Labor Costs have doubled

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Farming Challenges

- Water availability and cost
- Labor availability and cost
- High cost of entry into farming (land, equipment, capital)
  - Small niches are most attractive and beneficial to small farmers
- Large investors buying land and out-competing/buying out small farmers
  - Inflationary pressures
- High regulatory costs (compliance) – larger companies have more resources to comply
- Climate Change
  - Weather patterns are shifting
- Consumer disconnect
  - Broad brush stroke with which farming gets painted
  - Less than 1% of Americans work or live on farms in 2022; 30% in 1922

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Farming Solutions

- Ag tech one of fasting growing sectors in technology
- Adopting new technologies to overcome challenges
  - Water Savings (Phytech, Ceres Imaging, grid sampling)
  - Labor Savings (mechanization, automation)
- Focus and emphasis on soil microbiome
  - New products to enhance soil health and soil biology
  - Increasing yields while decreasing inputs such as fertilizer and water

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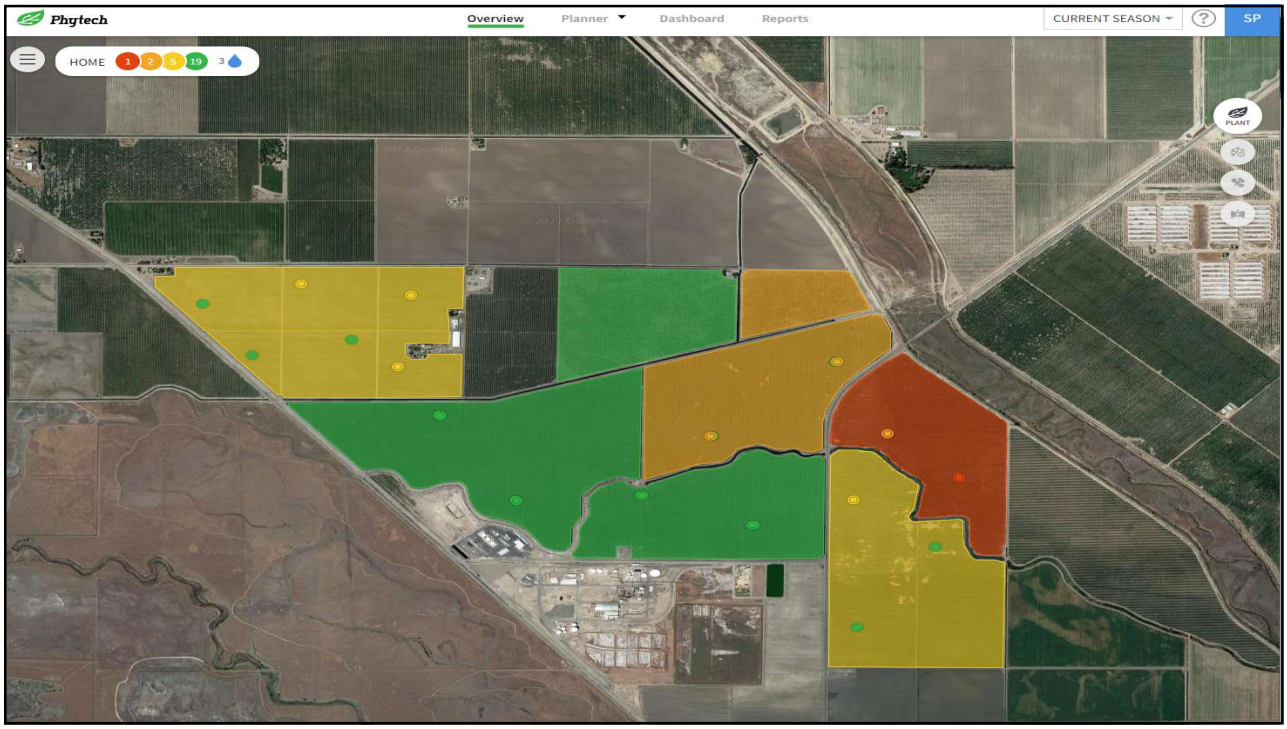
Phytech
Overview
Planner
Dashboard
Reports
CURRENT SEASON
SP
HOME
PLANT

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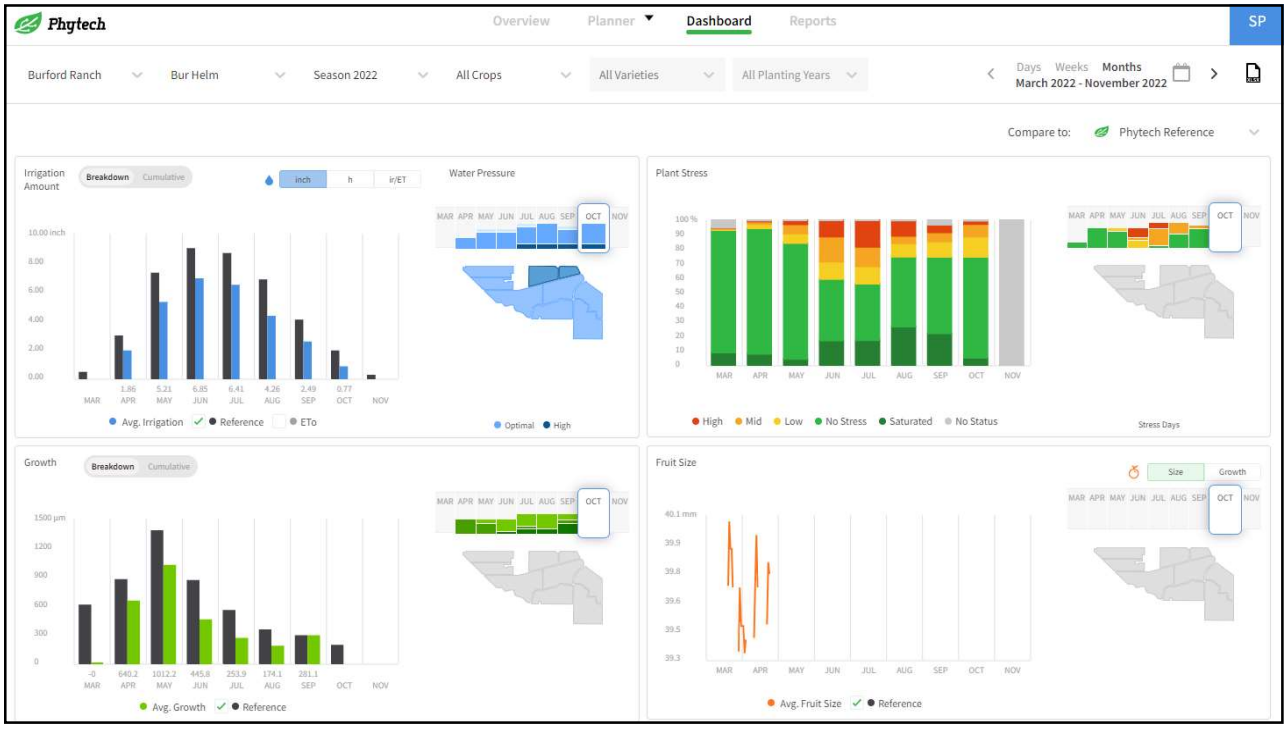
Phytech
Overview
Planner
Dashboard
Reports
SP
Burford Ranch
Bur Helm
Season 2022
All Crops
All Varieties
All Planting Years
Days Weeks Months
March 2022 - November 2022
Compare to:
Phytech Reference
Irrigation Amount
Breakdown
Cumulative
inch
h
ir/ET
Water Pressure
Avg. Irrigation
Reference
ETo
Optimal
High
Plant Stress
High
Mid
Low
No Stress
Saturated
No Status
Stress Days
Growth
Avg. Growth
Reference
Fruit Size
Size
Growth
Avg. Fruit Size
Reference

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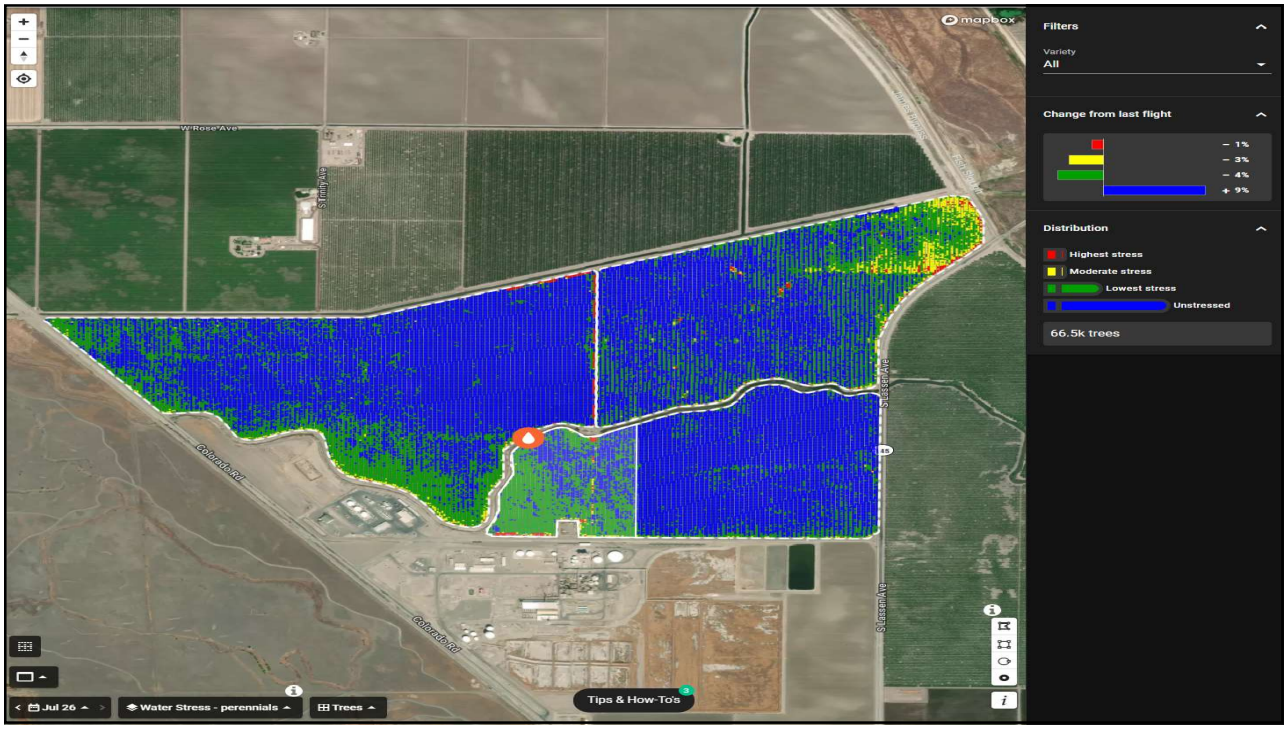
mapbox
W Rose Ave
S Tully Ave
Colorado Rd
Colorado Rd
Stassen Ave
Stassen Ave
Filters
Variety
All
Change from last flight
− 1%
− 3%
− 4%
+ 9%
Distribution
Highest stress
Moderate stress
Lowest stress
Unstressed
66.5k trees
Jul 26
Water Stress - perennials
Trees
Tips & How-To's

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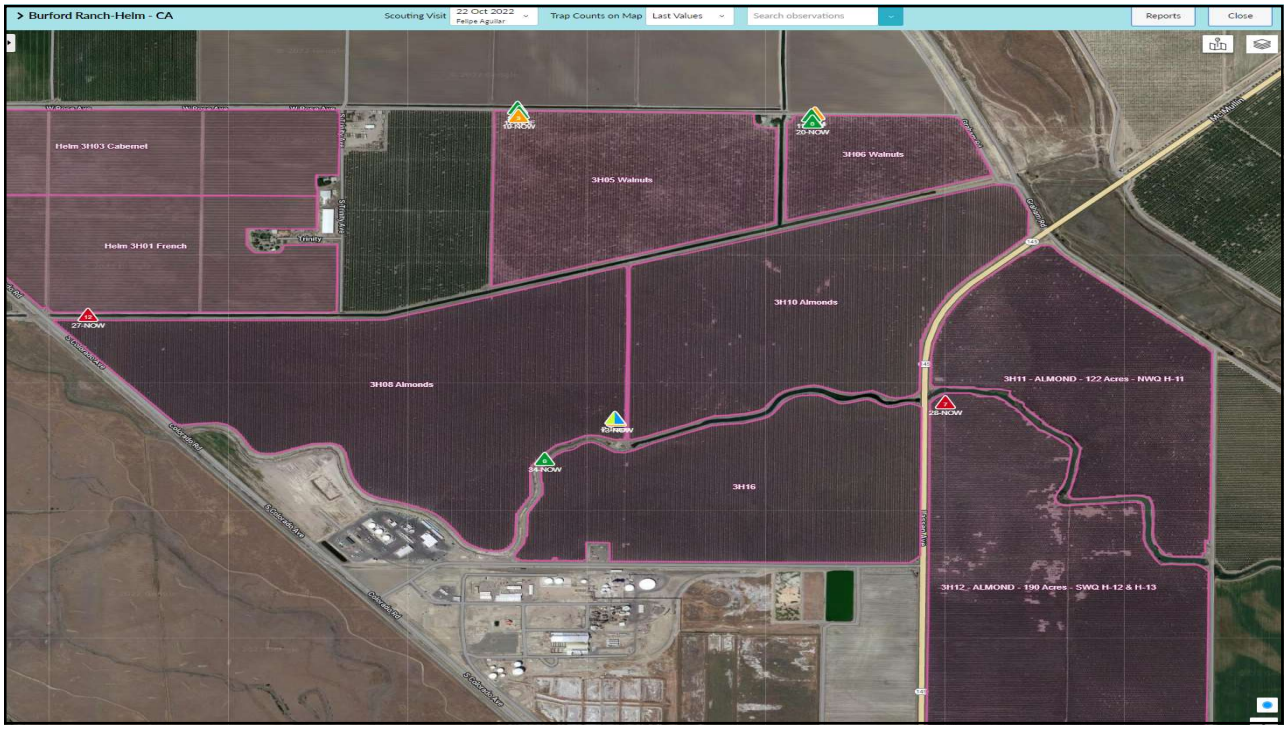

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Ag Technology

- Autonomous Tractors
- Autonomous Sprayers
- Autonomous Weeders

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Soil Microbiome

- Reduce or eliminate soil fumigation
- Increase soil biodiversity
- Enhance and introduce soil microbiology
- Feed the soil's microbiology
- Use of Manure from dairies, feedlots, poultry farms
- Cover Crops, improve soil drainage, beneficials (bees / microorganisms)
- KEY BENEFITS:
  - Increase water use efficiency
  - Reduced fertilizer use, more efficient use
  - Sustainable (regenerative agriculture)

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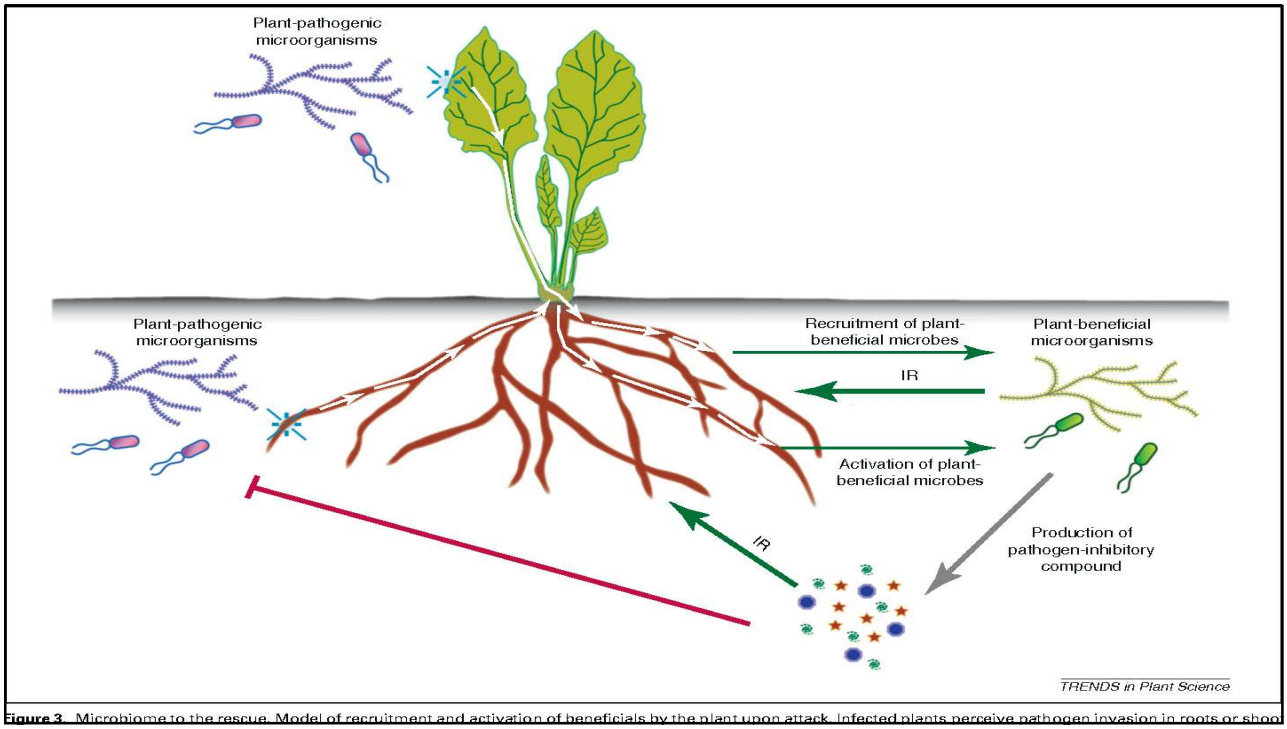

Figure 3. Microbiome to the rescue. Model of recruitment and activation of beneficials by the plant upon attack. Infected plants perceive pathogen invasion in roots or shoot

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Best Practices to Make Food Production and Agriculture Successful in the Future

- Continue to innovate and think outside the box
  - Adopting novel technologies to continue to save water, increase efficiencies
  - Produce more with less
  - Soil microbiome (huge opportunity for the future)
- Continued investment in new varieties and growing methods (greenhouse / vertical farming)
  - Weather patterns are shifting, and we must adapt our crops
  - Climate change: more rain, less frequently, chilling hours, hot summers
- CRISPR (not GMO) – see next slide)
- Waste reduction
  - How can we get more of our farm products into the store
  - Quality standards, blemished fruits are still perfectly good to eat
  - 40% of food produced is not consumed

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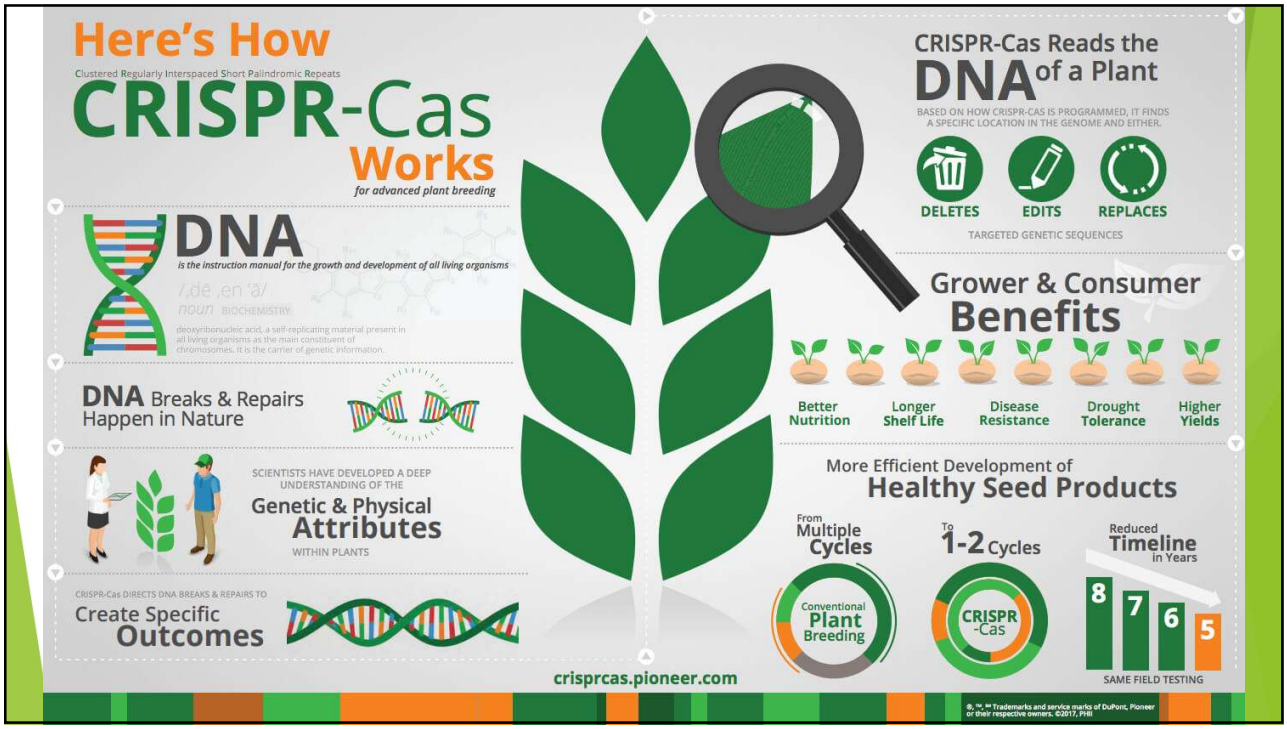

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Food Waste at the Farm Level

- Quality standards
- Buyers push for higher and higher quality
- Parsley example (ppb vs ppm), bug vacuum needed because bug body parts found with hyper-microscopes
- Most blemished fruit is perfectly fine to eat
- Is it the consumer or the retailer buyers pushing the high-quality standards?
- (watermelon rind worm damage, thrip in citrus) – Education
  - Potential for Reduced pesticide applications (thrip, worms) with lower quality standards

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Dietitian Partners Actionable Step

- The KEY is Connecting the consumer to the farmer:
  - Consumers eat the food
  - Dietitians are food experts
  - Farmers and Ranchers are food production experts
- Relatable information
  - Humans and plants have many similarities
  - A way to understand and appreciate agriculture

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Dietitian Partners Actionable Step

- Much like our own bodies, plants and animals need food and water to survive and thrive
  - Human: 1 gallon water per day; Cow: 9 gallons water per day; hotter days more water
  - Macronutrients – carbon, oxygen, hydrogen, nitrogen, phosphorus, potassium
  - Vitamins vs. Micronutrients – zinc, magnesium, sodium, boron
  - Gut microbiome vs soil microbiome
  - Medications for humans are like pesticides for plants, vaccines are medication for animals
- Intention is to keep organisms healthy and thriving to maximize vitality: production

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THANK YOU!

Questions?

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