

Park Farming Organics management team-Scott, Brian, Ulla





# CHANGE COMES FROM BUILDING A MODEL THAT MAKES EXISTING MODEL OBSOLETE

- R. BUCKMINSTER FULLER

- **REASON I AM HERE- TO EXPLAIN WHAT OUR FARM SYSTEM IS, WHY OUR FARM SYSTEM IS POSITIVE FOR THE PLANET, AND HOW A FARM TRANSITIONS INTO REGENERATIVE ORGANIC FARM PRACTICES**
- FARMING 51 YEARS, PAST 39 YEARS DEVELOPING A FARM SYSTEM THAT IS SOIL HEALTH DRIVEN (DID NOT KNOW THAT WHEN I STARTED ON THIS JOURNEY).
- FIRST GENERATION FARMER WITH MY SON, BRIAN AND WIFE, ULLA. BRIAN AND HIS WIFE JAMIE NOW RUN THE FARM. I SERVE AS AN OVER PAID PARTS RUNNER.
- FARM 10-20 DIFFERENT CROPS/YEAR. BASE CROPS- TOMATOES, RICE, WHEAT, CORN, VINE SEED, ALFALFA,, COVER CROPS FOR SEED, SUNFLOWER FOR SEED OR OIL, FRESH MARKET MELONS AND SQUASH, SORGHUM, AND FLAX.
- 1700 ACRES ON 27 FIELDS SOUTH OF MERIDIAN (50 MILES NORTH OF SACRAMENTO). THE FIELDS ARE SPREAD OVER 12 MILES ALONG THE SACRAMENTO RIVER OR NEARBY.
- THE FARM IS 100% REGENERATIVE ORGANIC CERTIFIED (ROC) EXCEPT FOR TWO FIELDS WE ARE TRANSITIONING TO ROC, BUT PRINCIPLES ARE APPLICABLE TO ANY TYPE OF FARM. NEED LONG TERM PERSPECTIVE, NO SHORT TERM FIX.
- SERENDIPITOUS RESULTS GUIDING FARM SYSTEM DEVELOPMENT
- WIDE RANGE OF SOIL TYPES, FROM SANDY LOAM TO CLAY
- FARM MANAGEMENT STRATEGY CONTINUES TO EVOLVE AS WE LEARN MORE EVERY YEAR ABOUT SOIL MANAGEMENT AND ITS BENEFITS. WE ARE FINDING **SOIL MICROBIOLOGY WORKS FOR US** AS IT IMPACTS IRRIGATION, FERTILITY, PEST PRESSURE, YIELD, QUALITY, EROSION, EARLY PLANTING OPPORTUNITIES, AND PROVIDES RESILIENCE AGAINST THE VAGARIES OF MOTHER NATURE.
- WE PLACE A LOT OF VALUE ON WHAT OUR 5 SENSES TELLS US ABOUT OUR FIELD HEALTH.

# WHY THE FARM EVOLVED OVER TIME

1974-1985

Business proposition

Clone neighbor activity

Chemical warfare

Max tillage

Income down, costs up

Dismal future

'85- new field, Epiphany

'86- first straw incorporation

'88- first cover crop

'89- dead birds in furrow,

'90- stop chemical use

'92- stop synthetic fertilizer

'95-present. Farm system modifications  
driven by serendipitous results.

No "road map".

Solve problems before they happen- soil  
health to the rescue!



Apocalypse Now





LESS GOVT REGS

MORE BENEFICIALS

CLEANER AIR, WATER

LESS GHG

NATURAL RESOURCE PRESERVATION

NUTRIENT DENSITY

QUALITY

CARBON SEQUESTRATION

FARM GENERATED INPUTS

SOIL STRUCTURE INPUTS

PLANT PROFIT

HEALTH

RESILIENCE

PEST

YIELD

WATER

CRITTER COVER

COMPOST

CONTROLLED TRAFFIC

COVER CROPS

CONSERVE INPUTS

CREW CARE

CROP ROTATION

CONSERVATION TILLAGE

CROP RESIDUE

PARK FARMING SOIL HEALTH SYSTEM- INPUTS /RESULTS/GOALS



## Life in the soil -365

- Fall and summer cover crops
  - Fall cover crops emphasis on legumes, quick breakdown, possibly grazed
  - Summer cover crops heavier with grains/multi specie, possibly grazed
- Cover crops contribute to-  
biodiversity, critter cover, minimize compaction from rain, eliminates erosion, earlier planting, provides fertility, water retention, carbon sequestration, “iron” replacement, microbe food



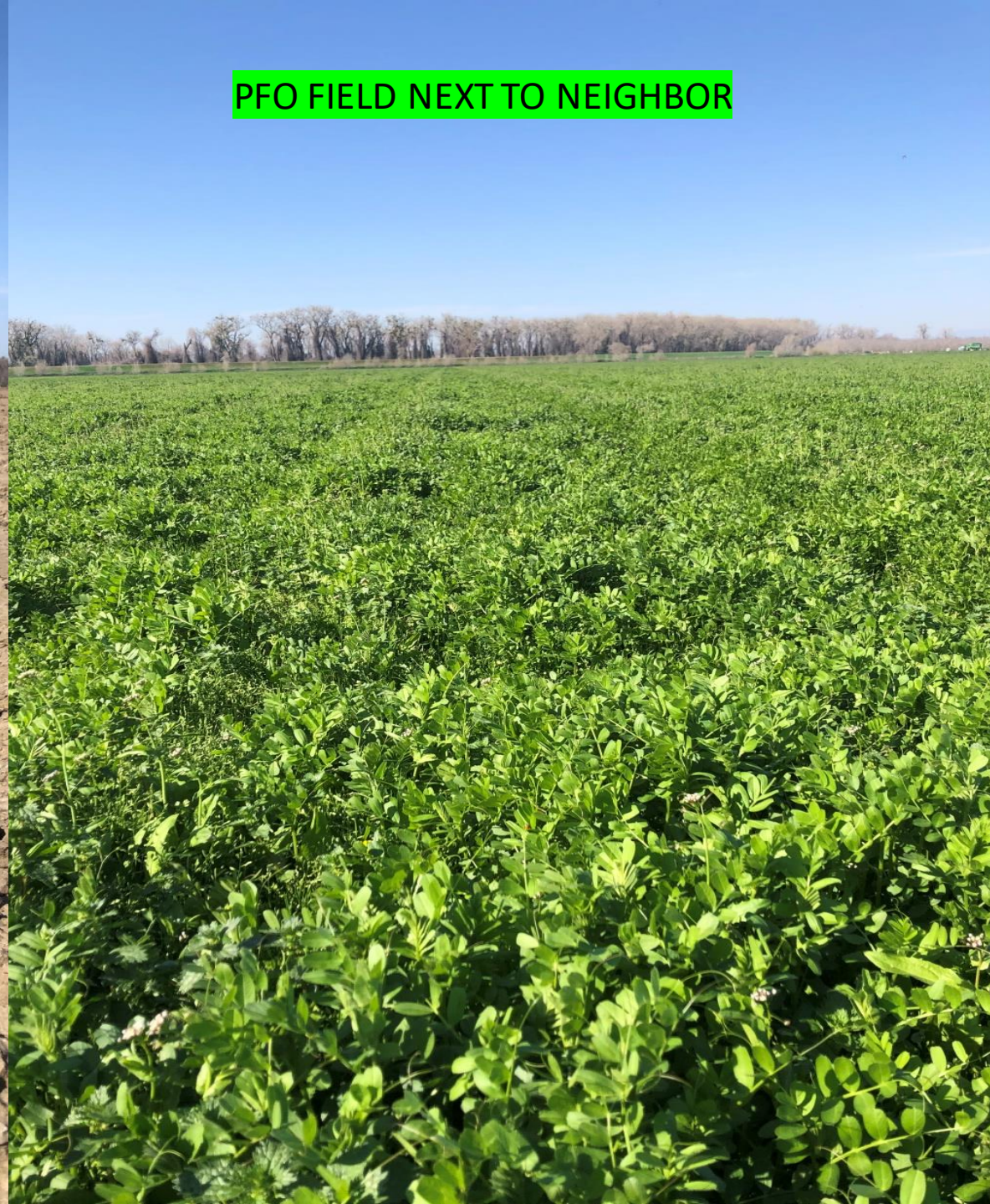
1<sup>ST</sup> “C” - COVER CROPS



NEIGHBOR'S FIELD IN WINTER



PFO FIELD NEXT TO NEIGHBOR





CHALLENGES OF COVER CROP TYPE, TIME OF INCORPORATION  
BRIAN PARK, PARK FARMING ORGANICS





## 2<sup>nd</sup> "C"- CROP ROTATION

One crop helps the next- insects, disease, fertility, time of planting (early best)

Great source of biomass, and diversity

Reduces insect, disease pressure by different plant timing, type of plants, type of tillage, different harvest dates, different fallow time, different cover crops

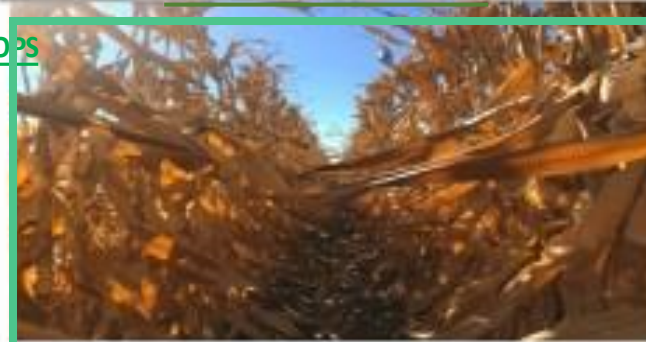




# CROP ROTATION

PARK FARMING ORGANICS  
3 CASH CROP ROTATION/COVER CROPS

CORN WITH CLOVER  
INNERPLANTED  
(EXPERIMENTING),  
GRAZED



VETCH CROP  
BEFORE  
HARVEST

MULTISPECIES  
COVER CROP AFTER  
CORN, GRAZED IN  
WINTER/SPRING



SUMMER  
MULTISPECIE  
COVER CROP  
FOLLOWING  
VETCH HARVEST,  
GRAZED

RICE FOLLOWING  
MULTISPECIES



PEA, VETCH  
WINTER COVER  
CROP

VETCH CROP  
AFTER RICE FOR  
SEED



TOMATOES  
AFTER 3 COVER  
CROPS!





all fields receive 10-15 tons/acre of biomass annually. Sources of biomass are- crop residue, compost, and cover crops. On years of good profit, gypsum added to “soil bank”



**3rd “C”- CROP RESIDUE**





**4TH "C" - CONSERVATION TILLAGE  
(NO TILL INTO CHOPPED RICE STRAW)**







## 4TH "C"- CONSERVATION TILLAGE

- Minimal bed disturbance-
- Tillage on top, sides of bed about 2" deep- **targeted tillage**
- Why tillage?
- Eliminate weeds
- Remove compaction in furrows
- Remove residue in furrows for furrow irrigation
- Incorporate compost after spreading
- Warm seed bed before planting
- Tomato harvester sickle wipes out "skin"





Earthworms enjoying a no till environment





## 5<sup>th</sup> “C” – CONTROLLED TRAFFIC

Note hands free “dancing” driver.  
Driver can dance as tractor steered by satellite- GPS to within 1” of desired path.

No tractor tire pressure on top of bed. Some fields have gone 12 years without tire pressure applied to top of bed.

GPS steering allows for accurate close cultivation of plants





## 6<sup>th</sup> "C"- COMPOST

Note compaction from tomato harvest on sides of beds

No tillage since tomato harvest. Compost spread, then incorporated 2" deep while furrows tilled 12-15" deep to break compaction.

Addition of compost adds nutrients, biomass, and microbial life. Rate applied determined by carryover of existing crop and needs of next crop.





## 7<sup>th</sup> “C”- Conserve inputs

MINIMALISM-

LESS PLANTS

LESS WATER

LESS NITROGEN

LESS TILLAGE

Get out of the way strategy  
if soil food web is thriving

Conserving inputs lets natural processes perform without trying to correct imbalances, saves money, less erosion, less pollution, healthier soil food web, increased carbon sequestration, decreased greenhouse gasses. Manipulation (conventional farming) versus minimalism (organic farming)





## #8th “C”- CREW CARE

Farm policy is to create a work environment that employees want to stay with farm forever. Almost zero turnover.  
Top dollar/hr  
100% health insurance  
Pension plan  
Profit sharing  
Gas supplied for vehicle  
0% interest loans  
No employee hierarchy  
Consistent hrs/day-  
(better home life)  
Community garden





## #9<sup>th</sup> "C"- CRITTER COVER

Borders kept as natural as possible, with chopping to keep weed seed out of field.

2 miles of hedgerows planted over last six years

Miles of ditches have natural growth allowed to flourish.

Millions of ladybugs released every year. Have stopped releases as population has become balanced.

Border growth/critters help keep natural balance in fields

Some environmental manipulation with owl boxes, predator perches for gopher and ground squirrel control







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FARM GENERATED INPUTS

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PLANT HEALTH

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CROP RESIDUE

PARK FARMING SOIL HEALTH SYSTEM- INPUTS/ RESULTS / GOALS



**Table 1: YIELD AND WATER USE EFFICIENCY**

| Treatment         | Yield<br>Tons per<br>Acre | Harvest<br>Index | WUE<br>(T/acre<br>feet) |
|-------------------|---------------------------|------------------|-------------------------|
| 45 day<br>Deficit | 62.00                     | 0.844            | 27.17                   |
| 30 day<br>Regular | 62.69                     | 0.849            | 22.01                   |
| p-Value           | 1                         | 0.7              | 1                       |

Resilience study for OFRF – 2016.  
Conducted by Amelie Gaudin, UC  
Davis professor of soil agroecology.

STANDARD WATER CUT OFF DAYS BEFORE HARVEST- 14  
DAYS

GOOD ORGANIC PROCESSING TOMATO YIELD- 40 TON/AC

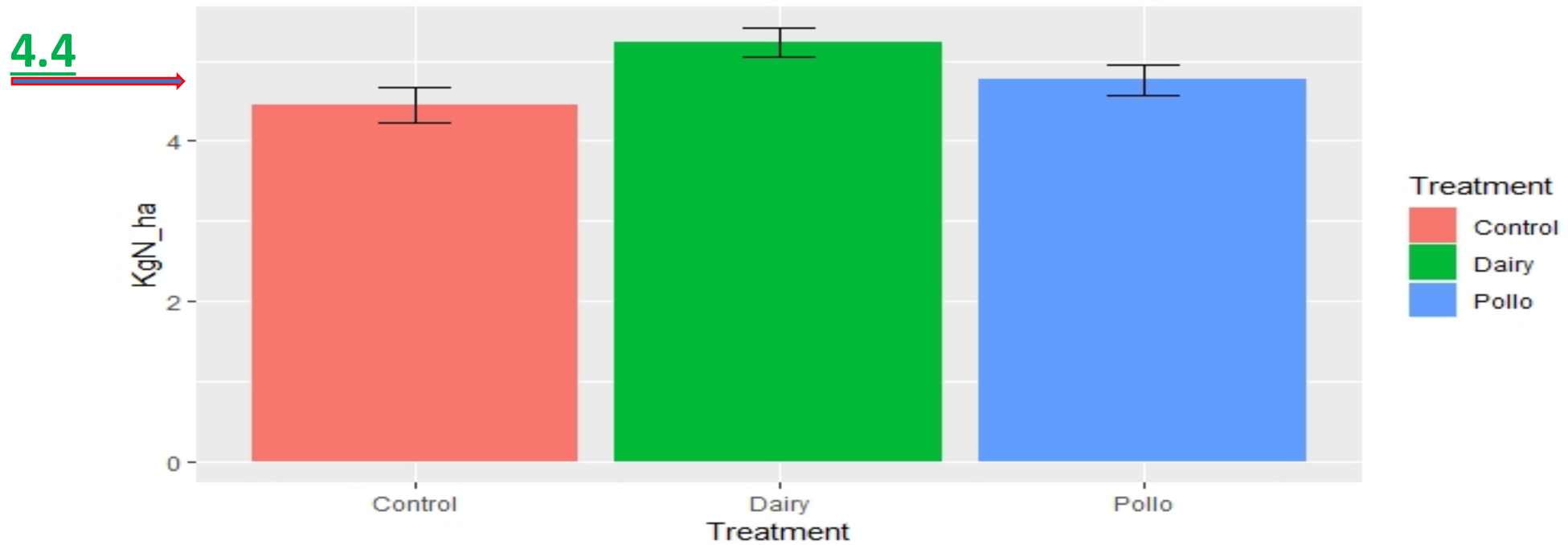


COVER CROP ONLY INPUT ON RICE GROWN FOR SHUMEI NATURAL AGRICULTURE  
YIELDS EQUIVALENT TO CONVENTIONAL RICE.





Park Farming Nitrogen leaching in winter, 2019  
Amelie Gaudin, UC Davis professor of soil agroecology





N leaching comparison- Park Farming 4.4 kg N-NO<sub>3</sub>/ha

Russell Ranch Paper - Russell Ranch

- Organic tomato + WCC ~ 7.2kg N-NO<sub>3</sub> / ha

Yolo County wheat field

- Organic grain + WCC ~ 15-20kg N-NO<sub>3</sub> / ha

New Mexico corn field

- Conv maize with residue incorporation ~ 80kg N-NO<sub>3</sub> / ha



# Water retention?

TRANSITION FIELD



10 YEAR SUSTAINABLE APPROACH





Resilience?



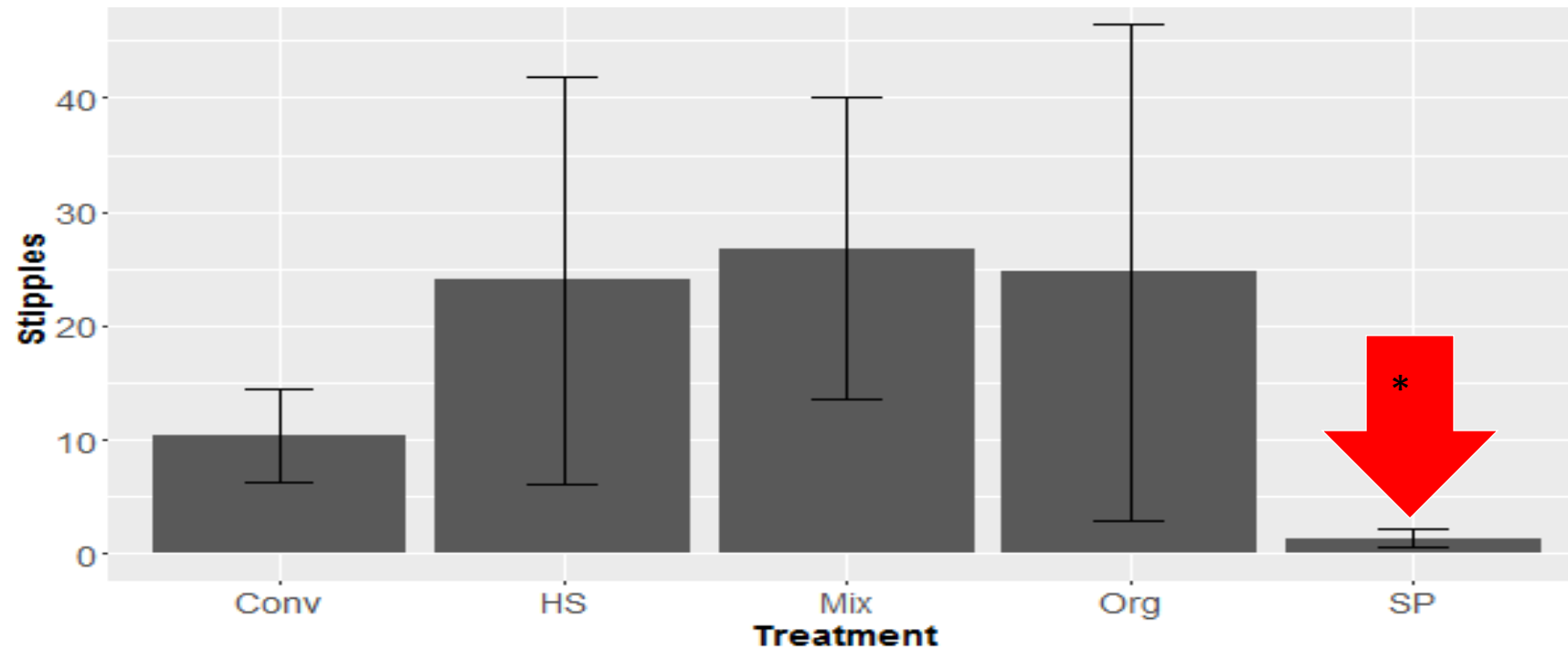


# Soil management affected leafhopper feeding

Pest  
Impact

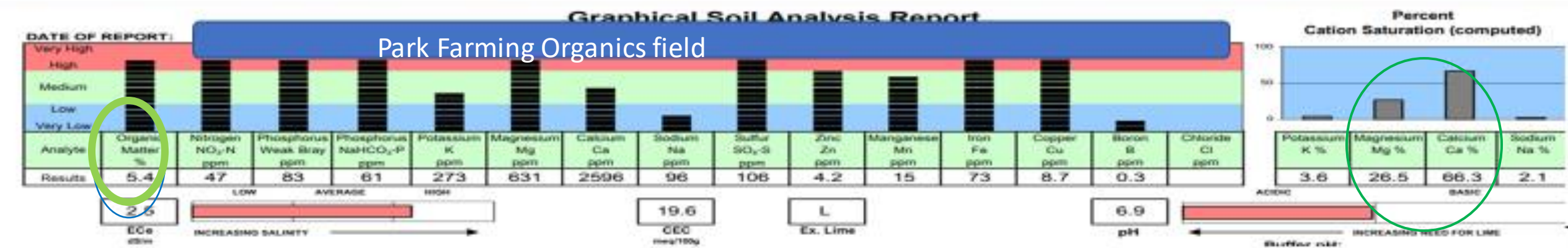
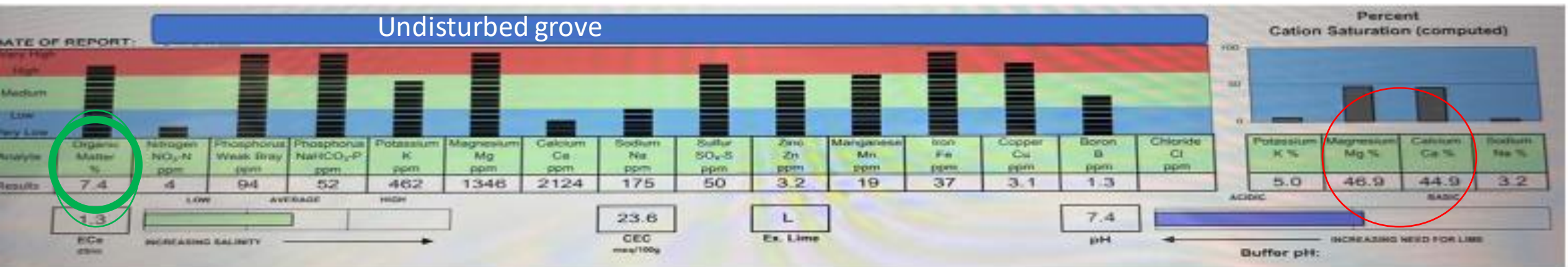
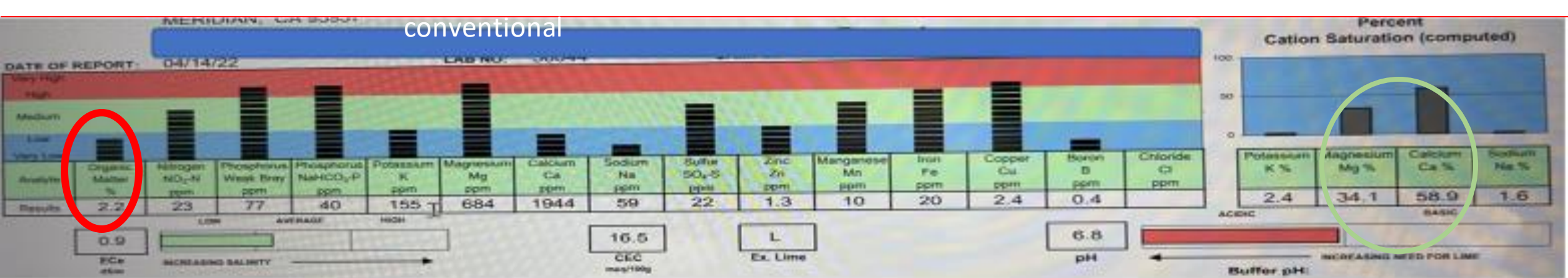
No spray for  
10 years

Amelie credit



CTRI sponsored research (2016)- Reducing insect virus vectors of BCTV in processing tomatoes through soil health management







WINTER COVER CROP SERVING AS  
CARBON, NITROGEN, WATER  
COLLECTOR PLUS KEEPING  
MICROBIAL LIFE ENERGIZED.





# HOW TO TRANSITION TO REGENERATIVE ORGANIC

- WE HAVE TRANSITIONED 36 FIELDS OVER THE LAST 32 YEARS- BE PATIENT, HAVE LOW RETURN EXPECTATIONS FOR THE FIRST THREE YEARS
- 5 YEAR PLAN
- THREE YEAR PROCESS OF “TRAINING MICROBES” TO THRIVE ON NATURAL SOURCES, NOT SYNTHETIC
- GROW LOW INVESTMENT, LOW RISK CROPS
- PLANT COVER CROPS EVERY OPPORTUNITY- AFTER CASH CROPS, BEFORE CASH CROPS, IN CASH CROPS
- USE PLENTY OF COMPOST
- HAVE DIVERSITY IN CROPS, COVER CROPS GROWN
- EXPECT LITTLE OR NO PROFIT IN INITIAL 3 YEARS
- PROFIT IN 4<sup>TH</sup> YEAR
- VERY HEALTHY, EFFECTIVE CYCLING MICROBIAL LIFE IN 5<sup>TH</sup> YEAR, YEARS AFTER
- INITIALLY, TILL AGGRESSIVELY
- CROP ROTATION EXAMPLE-



FALL 2024 WHEAT



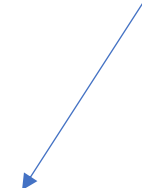
SUMMER 2025  
MULTISPECIE COVER  
CROP



FALL 2025  
WINTER LEGUME  
COVER CROP



SPRING 2026  
SUNFLOWER OR  
SAFFLOWER CROP



FALL 2026  
MULTISPECIE  
COVER CROP

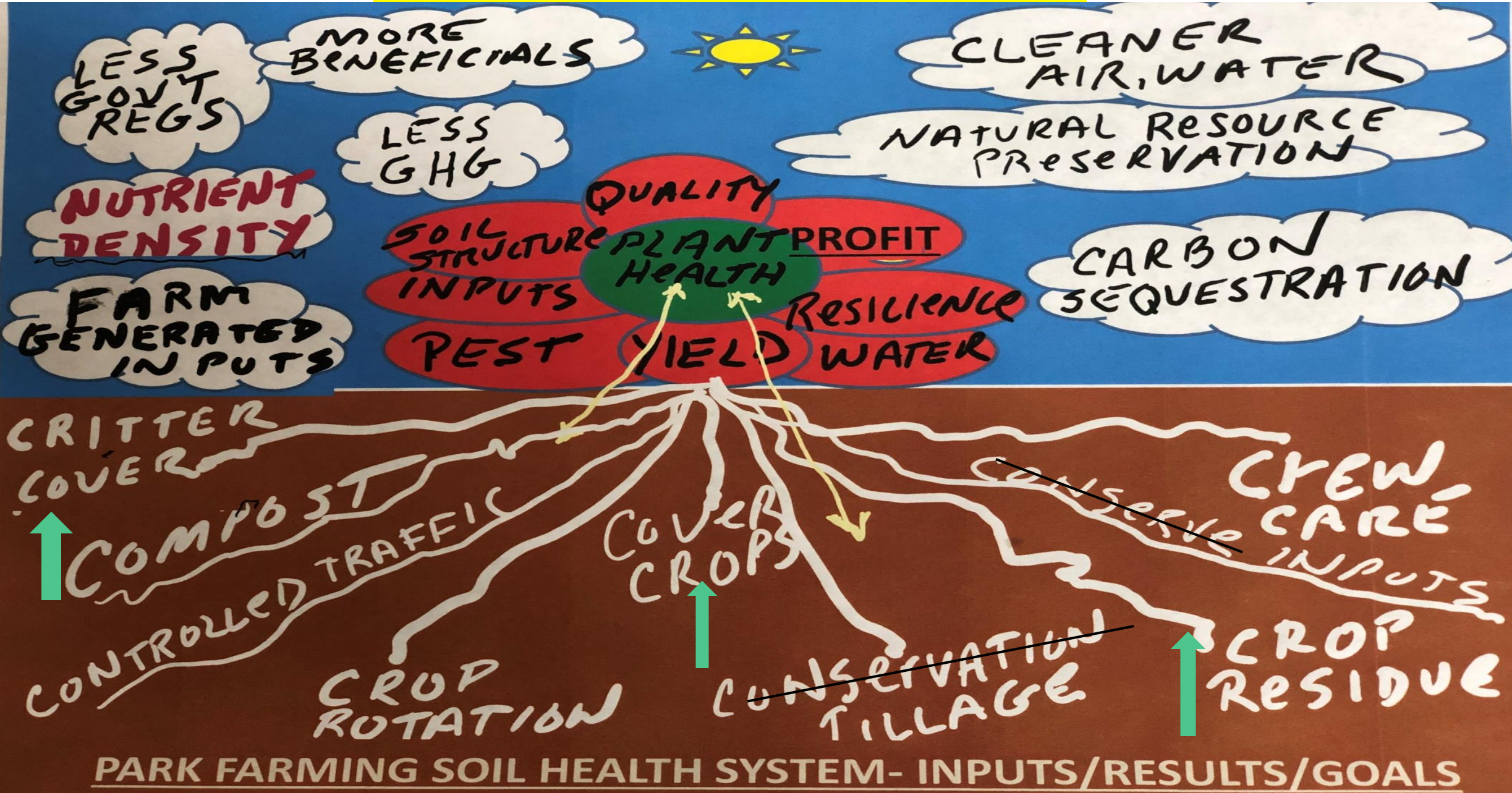


LATE SPRING 2027  
FRESH MARKET  
SQUASH CROP





TRANSITION TO REGENERATIVE FARMING STRATEGY



PARK FARMING SOIL HEALTH SYSTEM- INPUTS/RESULTS/GOALS



SACRAMENTO WINTER "CATTLE" HAVING A  
COVER CROP FEAST!





DOES NOT THIS SCENE  
EXEMPLIFY WHAT  
**350 SACRAMENTO** IS  
TRYING TO SAVE? WILL  
OUR GRANDCHILDREN  
HAVE THE  
OPPPORTUNITY TO  
STAND IN AWE OF  
NATURE?





SLIDES BELOW ARE EXCESS BAGGAGE!



















WINTER LEGUME COVER CROP WITH VOLUNTEER MUSTARD AND RADISH





