

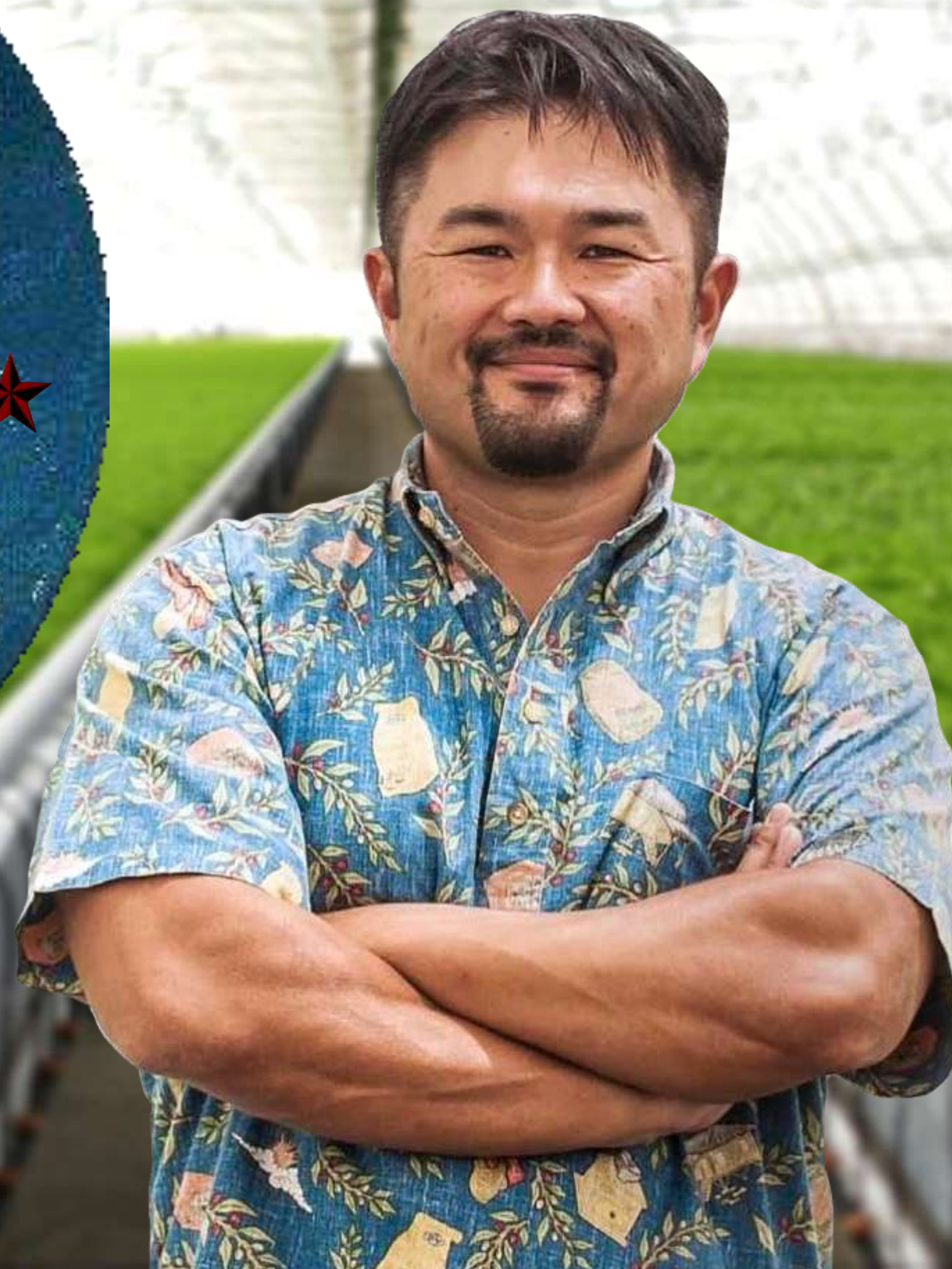
Challenges & Way Forward 2021



SMART YIELDS

CROP PROTECTION & YIELD ENHANCEMENT

Brunei Darussalam Conference on Agriculture









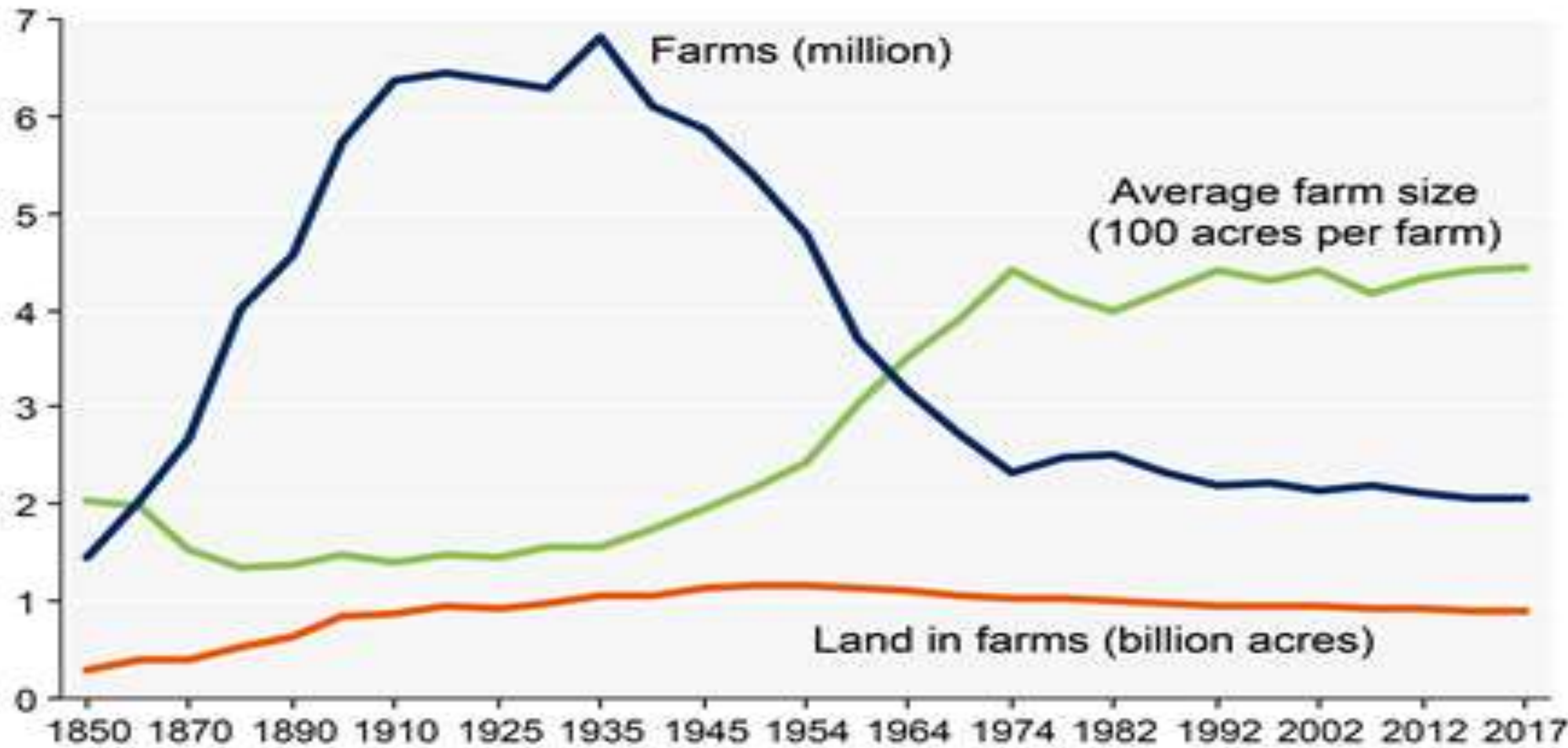
“Data are just summaries of thousands of stories – tell a few of those stories to help make the data meaningful.”

Chip & Dan Heath

Farms, land in farms, and average acres per farm, 1850-2017

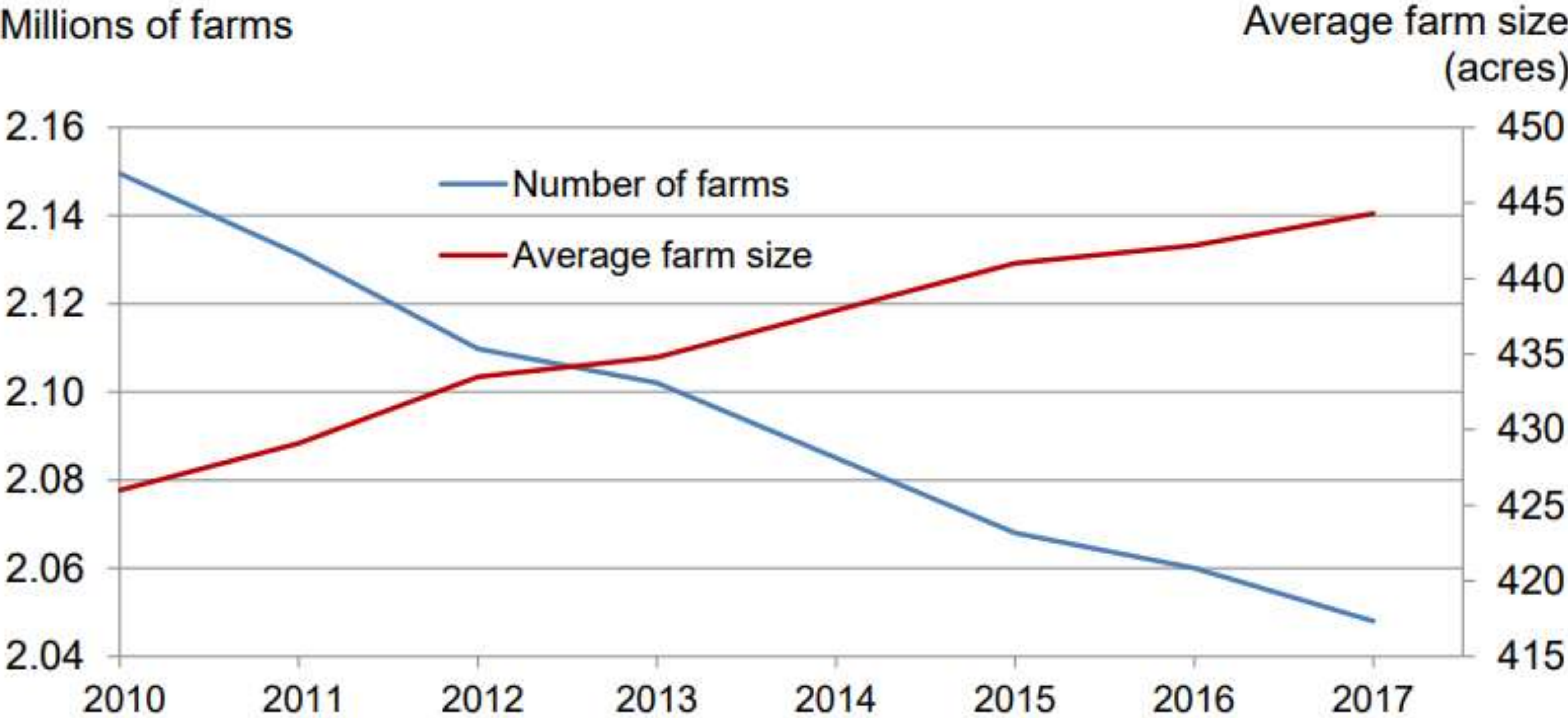


Million farms, billion acres, or 100 acres per farm



Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service, Census of Agriculture (through 2012) and *Farms and Land in Farms: 2017 Summary*.

Number of Farms and Average Farm Size – United States: 2010-2017



85%

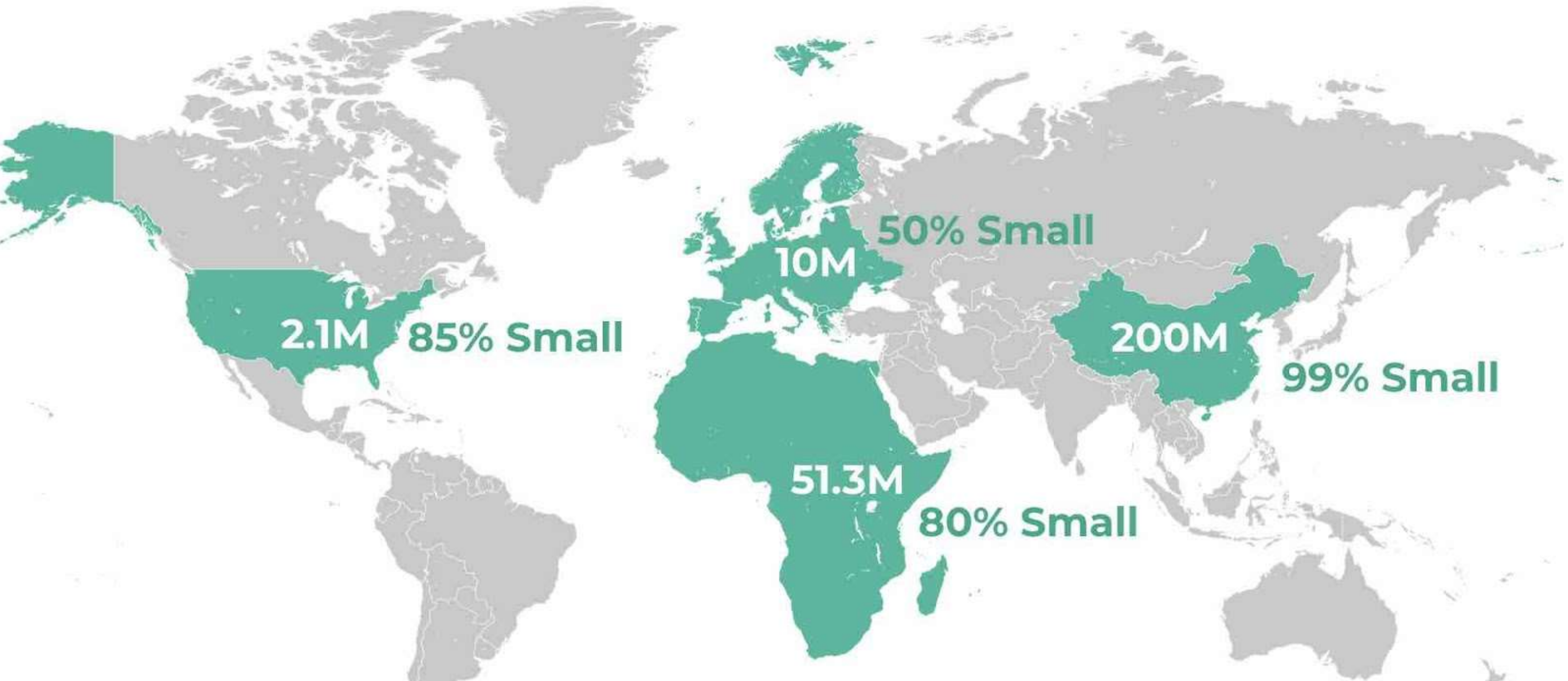
**OF ALL FARMS
ARE SMALL TO
MEDIUM SCALE**

***1.7M ARE SMALL BY ACREAGE**



570M Farms in the World:

87% are Small Farms (<2 hectares)





\$0.09

**OF EVERY DOLLAR
GOES TO THE FARMER**

***FARMERS ARE LIVING IN POVERTY**



**NOT ALL DATA IS
CREATED EQUAL**

Farmer's Almanac?

Farming over the last 5 or 10 years is unpredictable
We cannot farm the way we have done...



Smart Farming: Data Sources



**SATELLITE
IMAGERY**



UAV



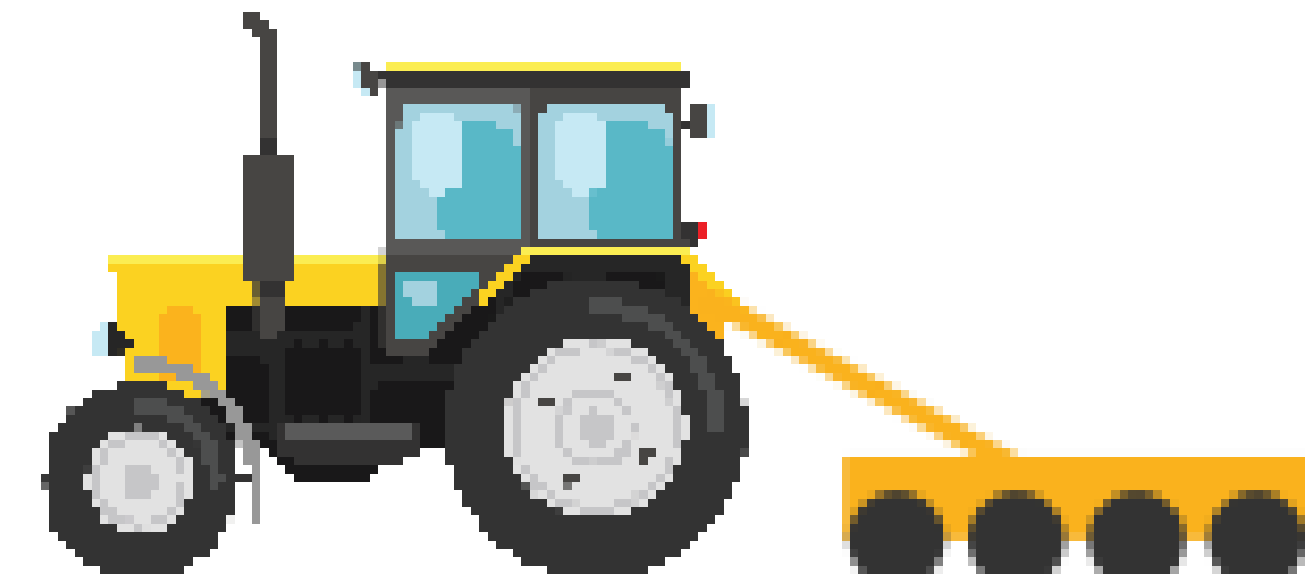
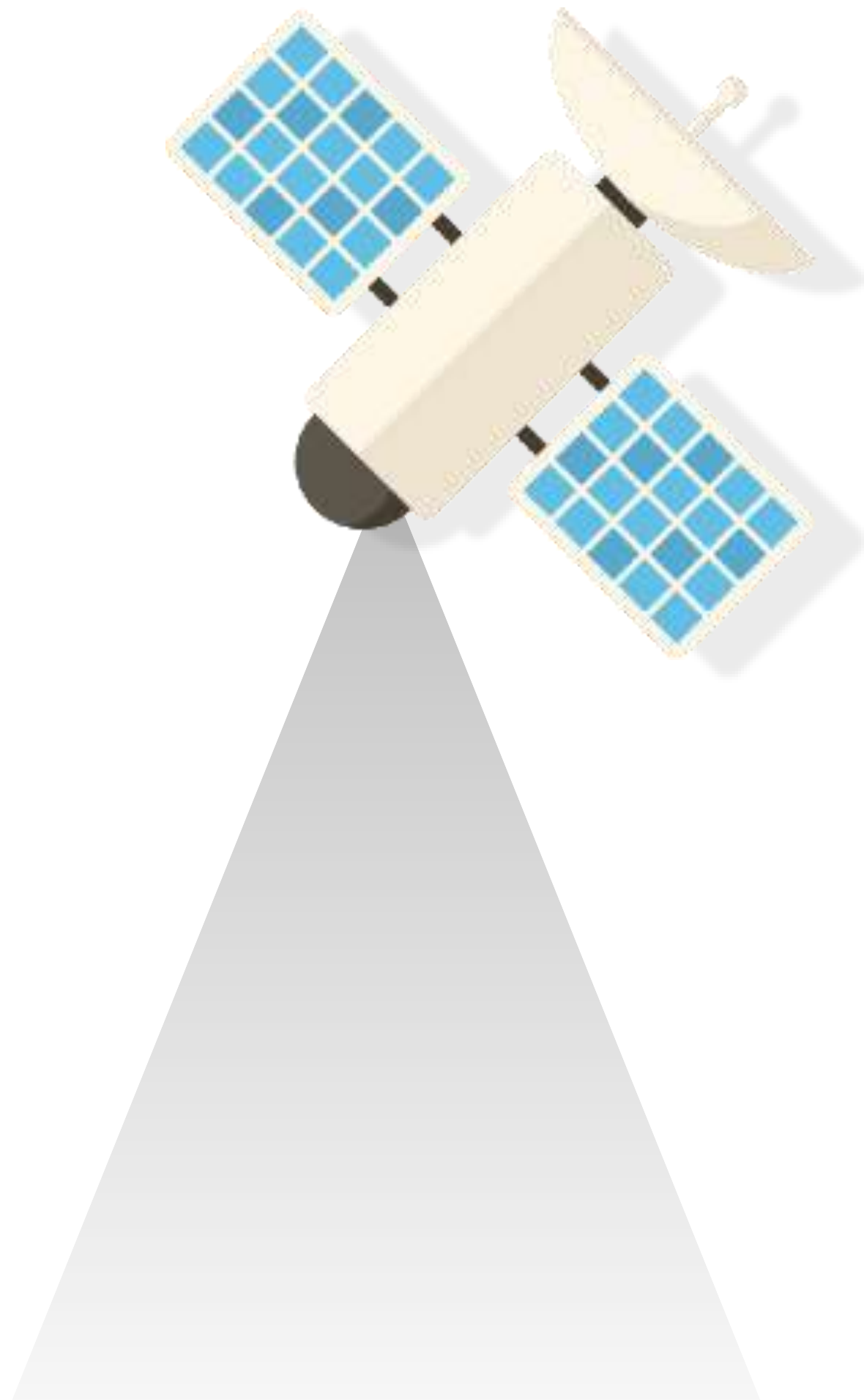
**VARIABLE RATE
TECHNOLOGY**



Smart Farming Tools



**Smart Farming technology's
value proposition differs greatly
from large mono-crop farms and
small multi-crop farms**



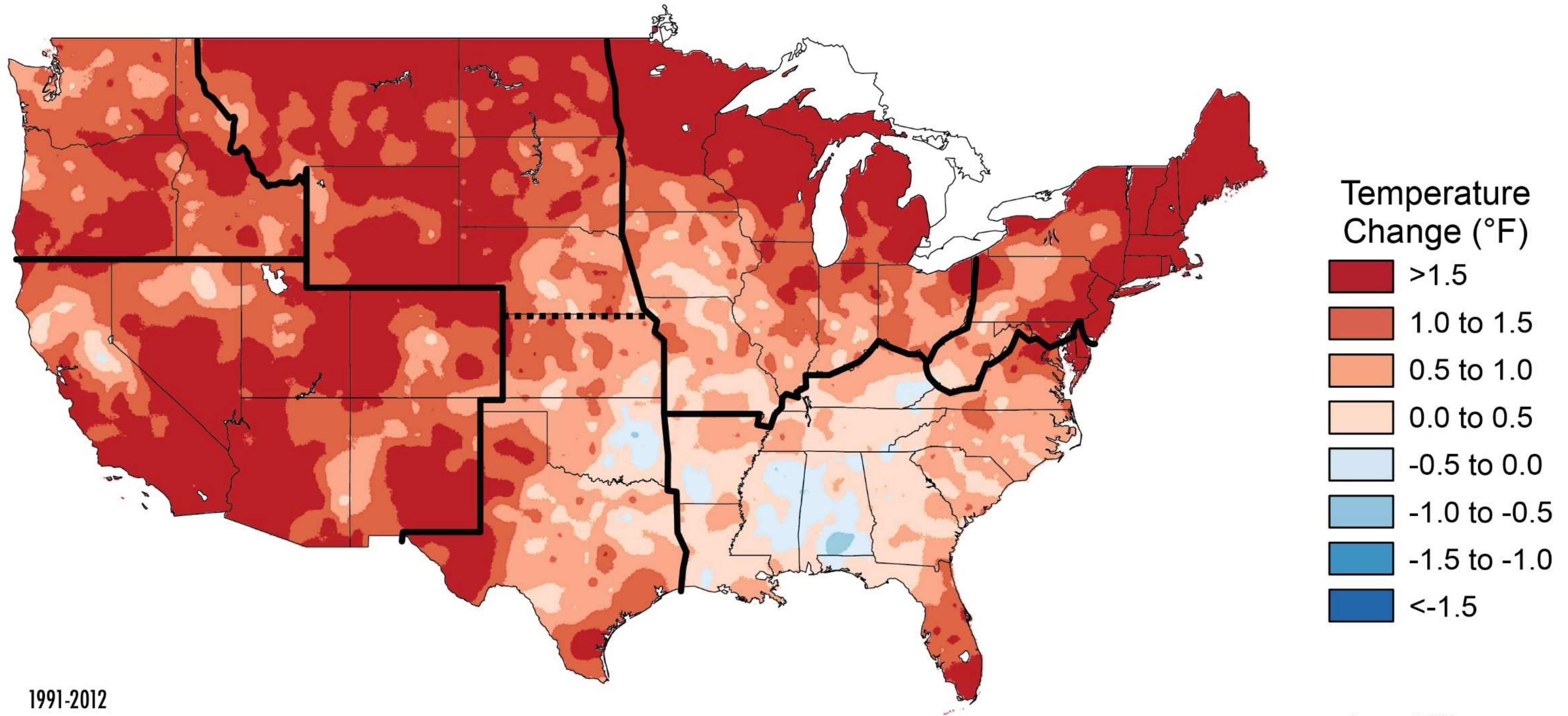


HOW DO YOU KNOW YOUR DATA IS ACCURATE?



DATA ACCURACY
COMES THROUGH
DATA
REDUNDANCY

Observed U.S. Temperature Change



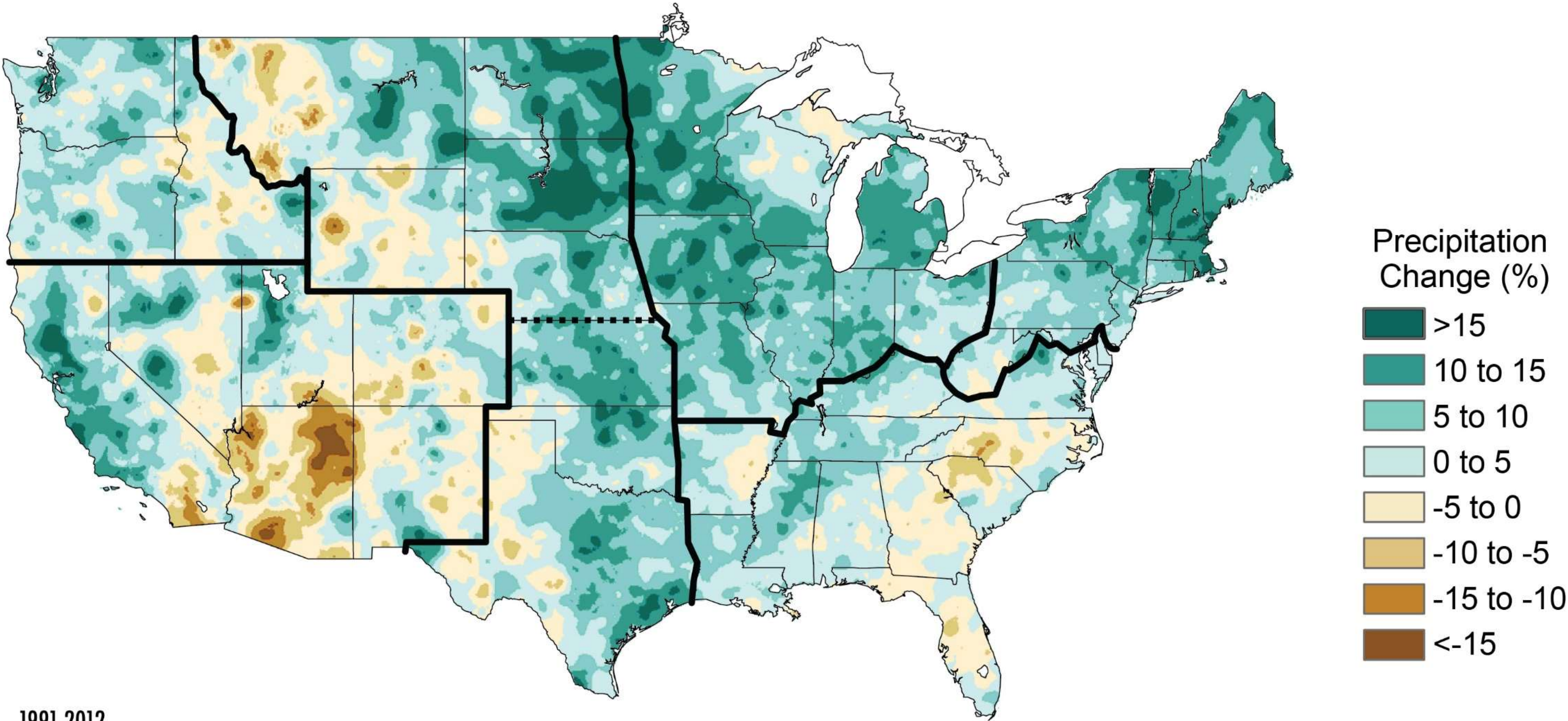
1991-2012

Source: NASA



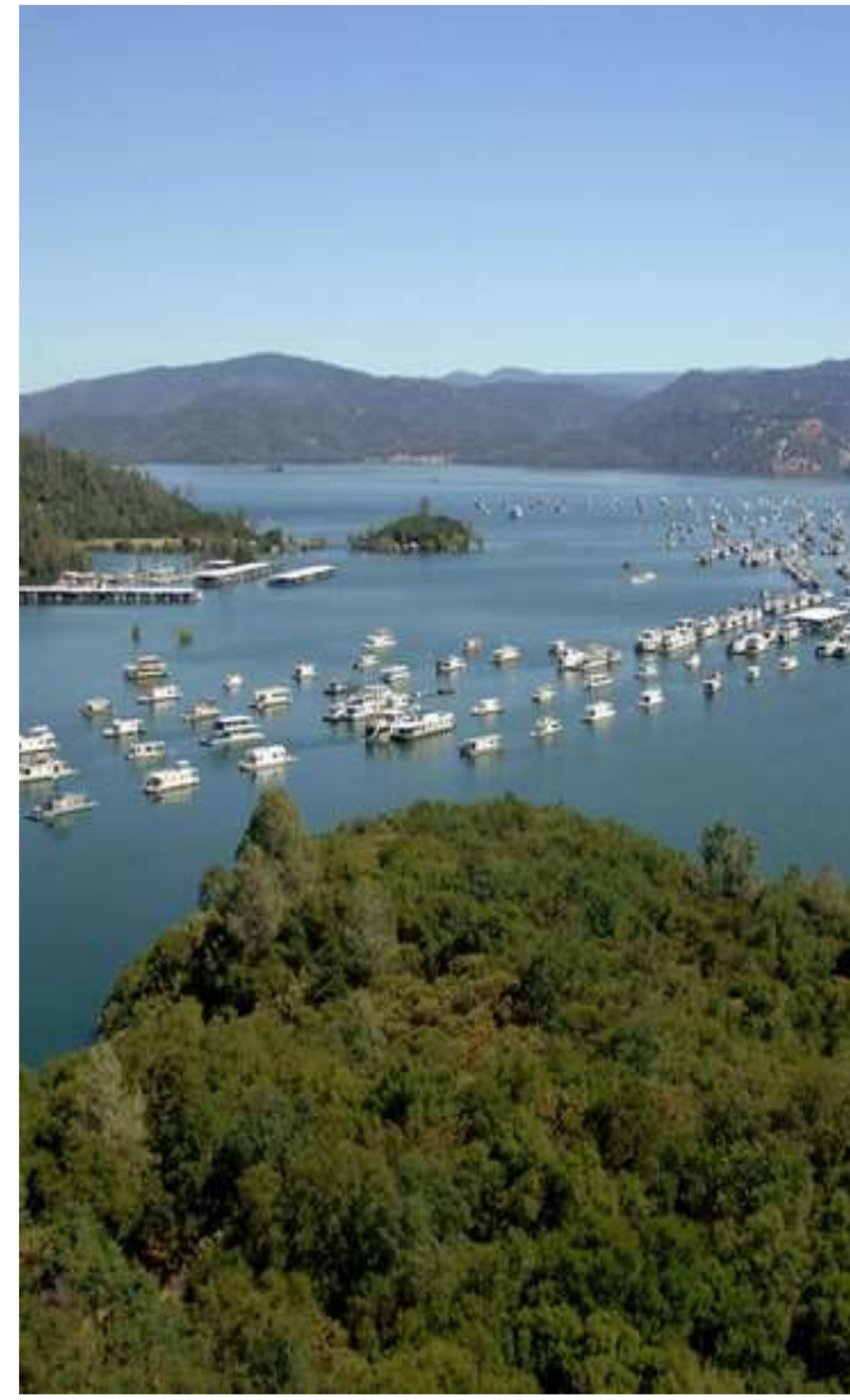


Observed U.S. Precipitation Change



1991-2012

Source: NASA

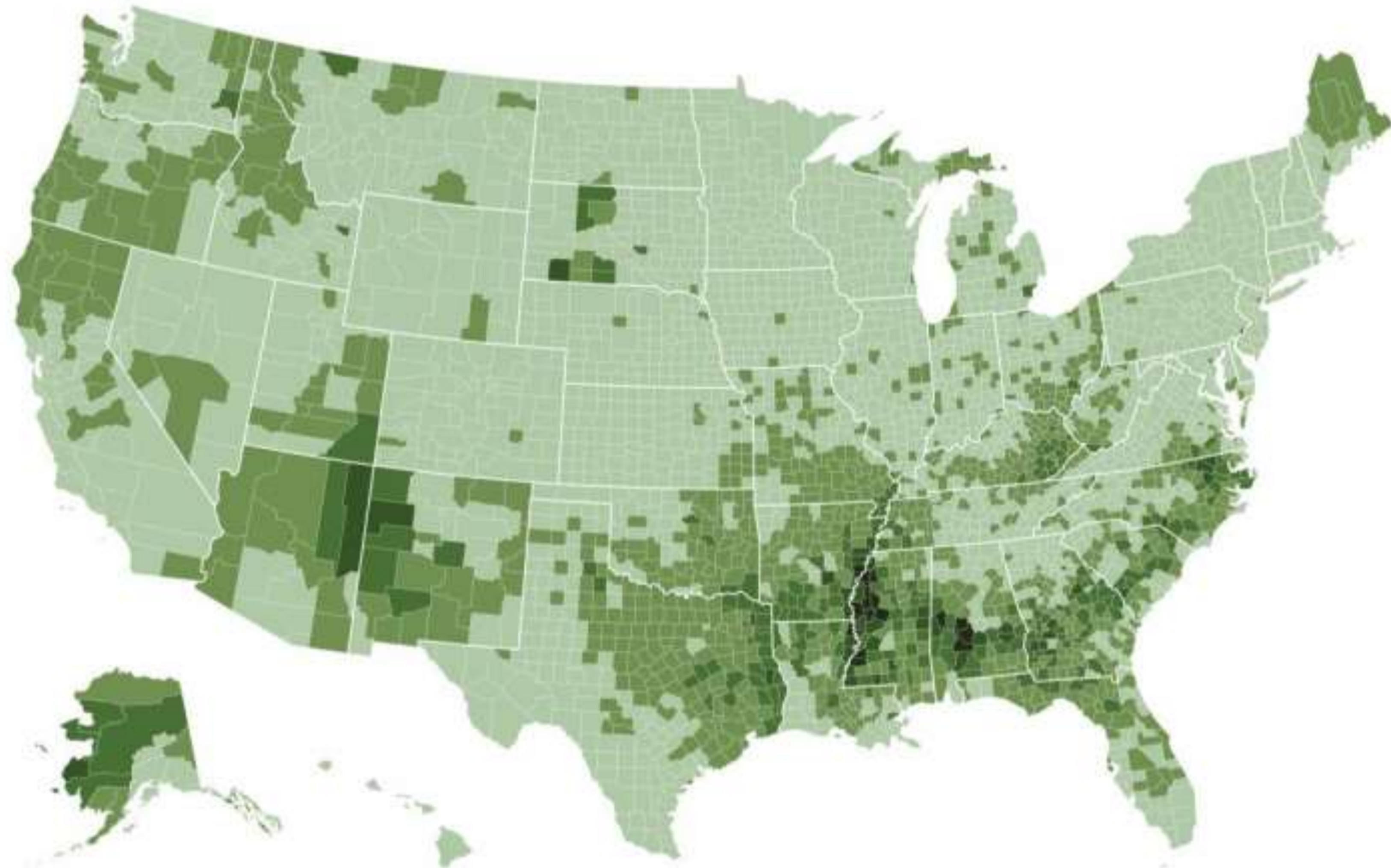


2050
sea level

2030
sea level



ESTIMATING FOOD INSECURITY AT THE COUNTY LEVEL, 2016



Food Insecurity Rates

4-14%

15-19%

20-24%

25-29%

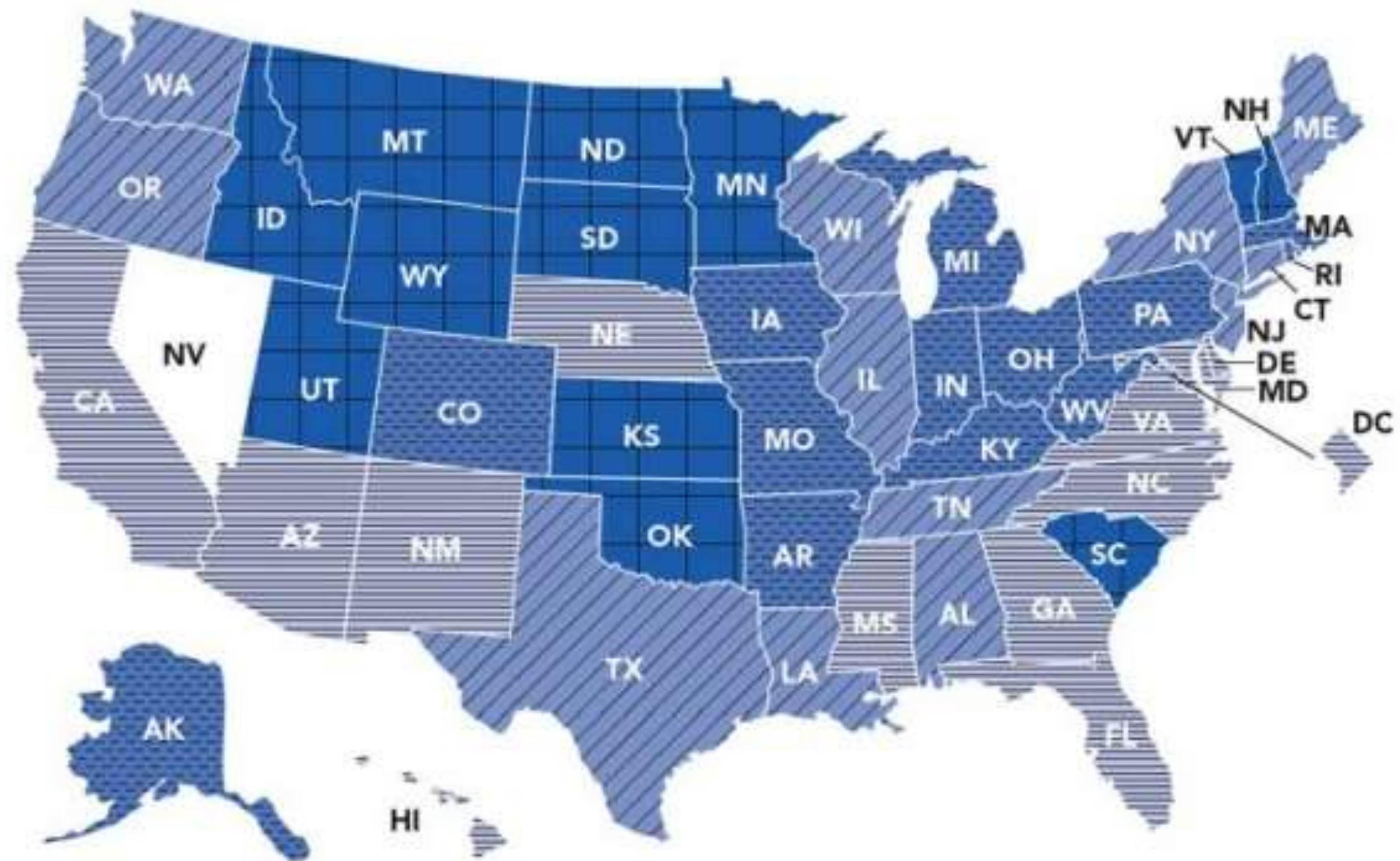
30% +




Suicide rates rose across the US from 1999 to 2016.



SOURCE: CDC's National Vital Statistics System;
CDC Vital Signs, June 2018.



A person's hands are visible holding a rectangular wooden sign. The sign has a black background with white text. Above the sign, a brown cowboy hat is perched on a green corrugated metal surface. The background is a green corrugated metal wall.

US farmer suicide crisis echoes a much larger farmer suicide crisis happening globally:

- an Australian farmer dies every 4 days
- UK, one farmer a week
- France, one farmer dies every 2 days
- India, more than 270,000 farmers have died since 1995.

The Guardian Dec 2018



Creating Agripreneur out of farmers to promote adoption of modern agricultural technologies

Aala Forum on Smart Agriculture
Vincent Kinnara, CEO Smart Agri

| MAGAZINE |

THIS TINY COUNTRY FEEDS THE WORLD

The Netherlands has become an agricultural giant by showing what the future of farming could look like.



GREENPORT
West-Holland



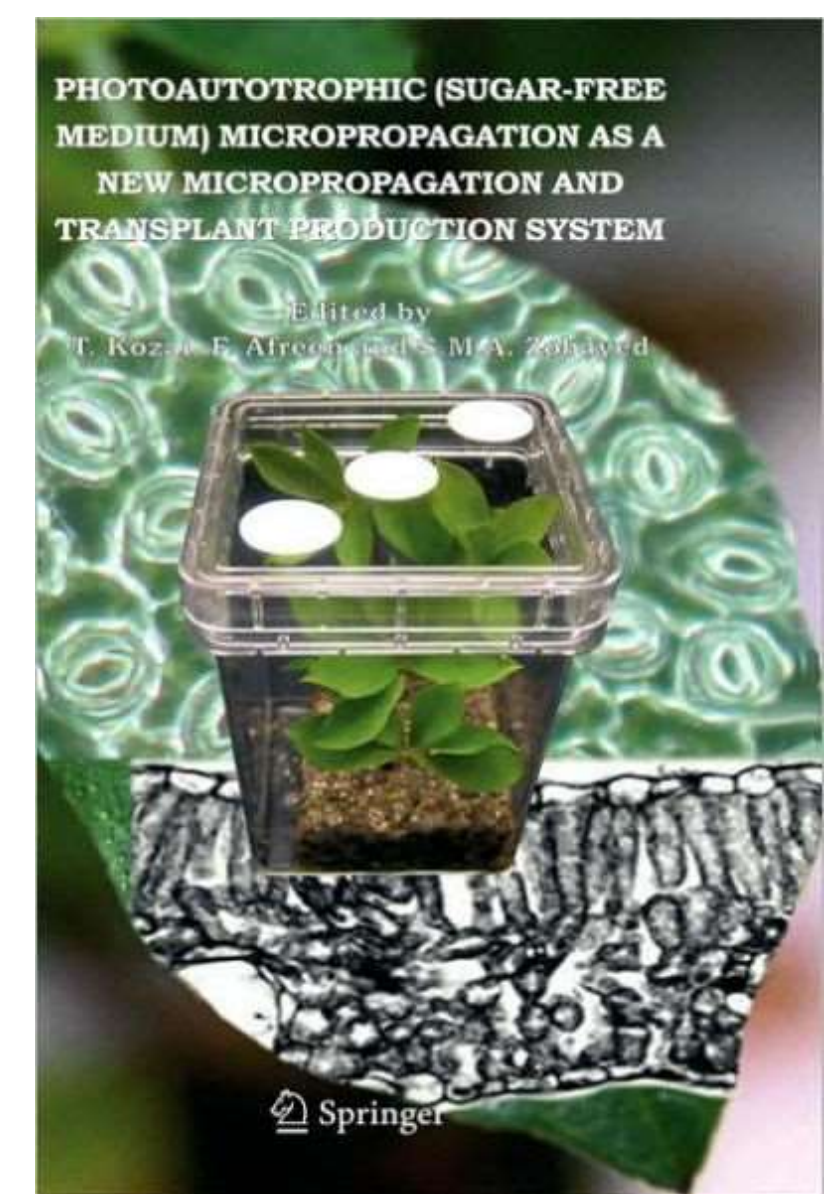
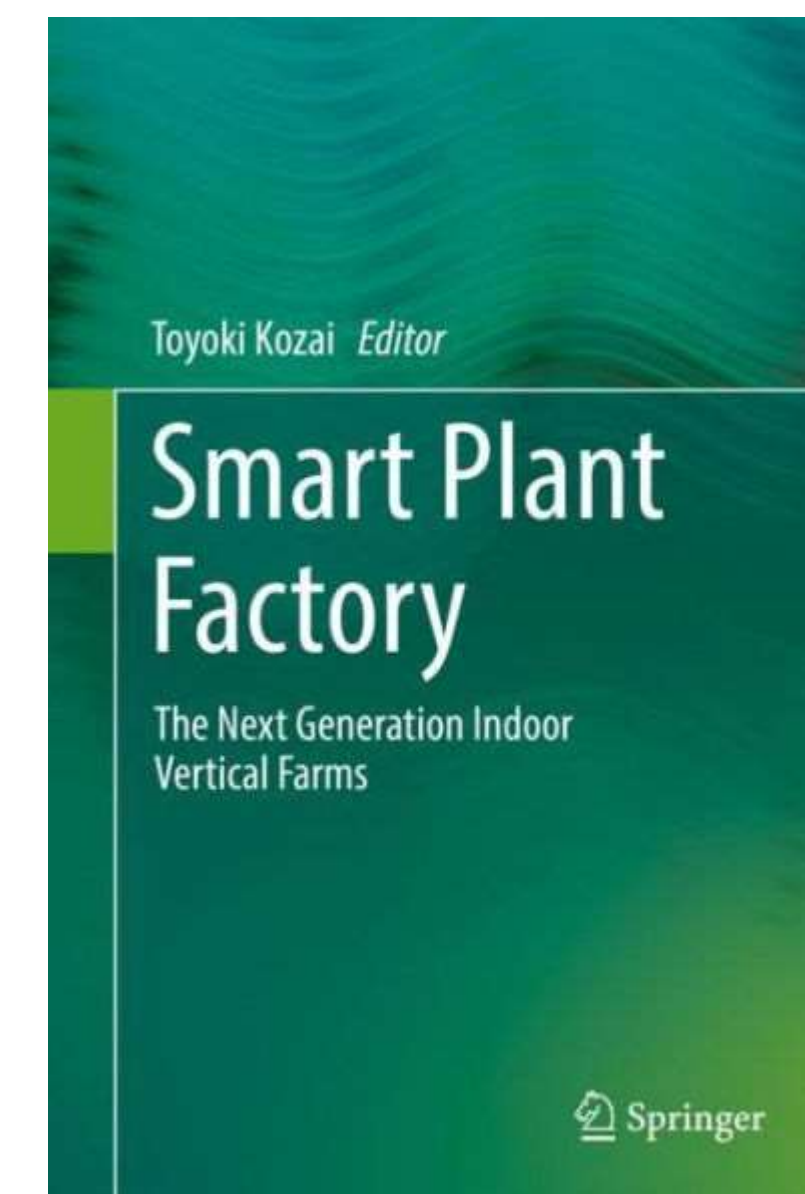
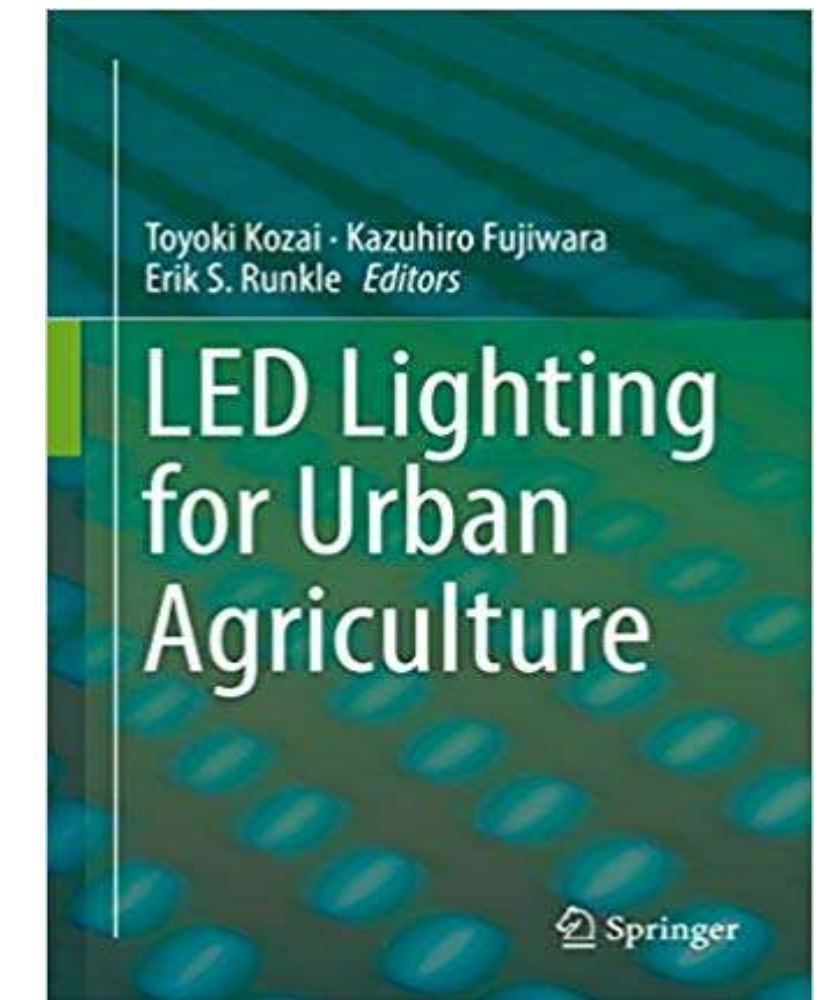
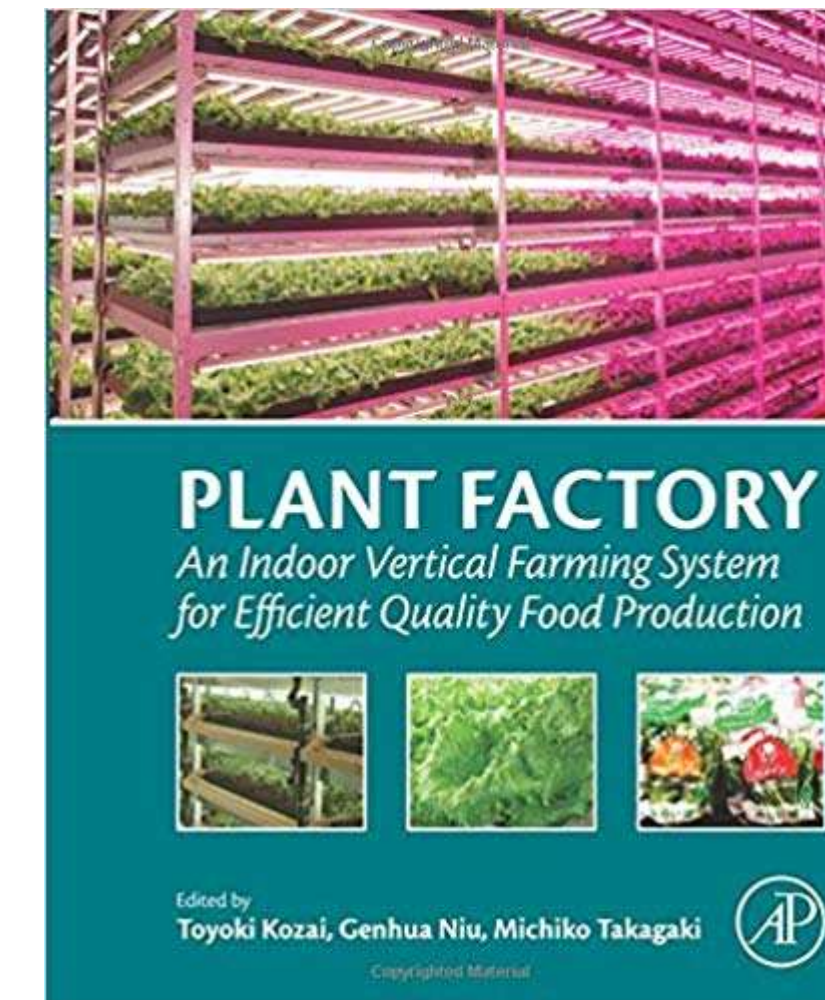


Dr. Toyoki Kozai

President

Japan Plant Factory Association

“Father of Vertical Farming”



Currently on the 5th Generation of Indoor Growing



V1

**PLANT
FACTORY
(PFAL)**

V2

(PFAL)

V3

(PFAL)

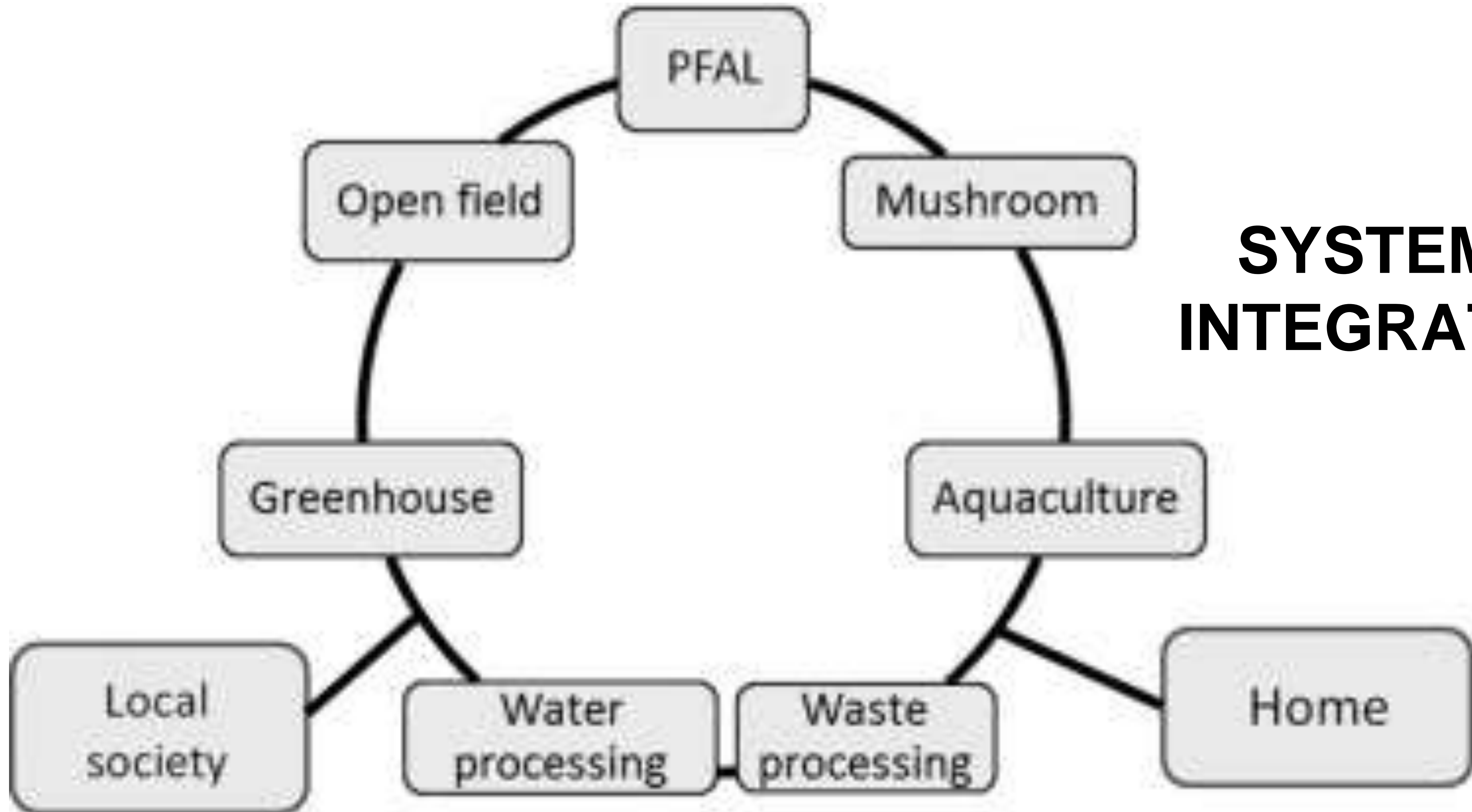
V4

(PFAL)

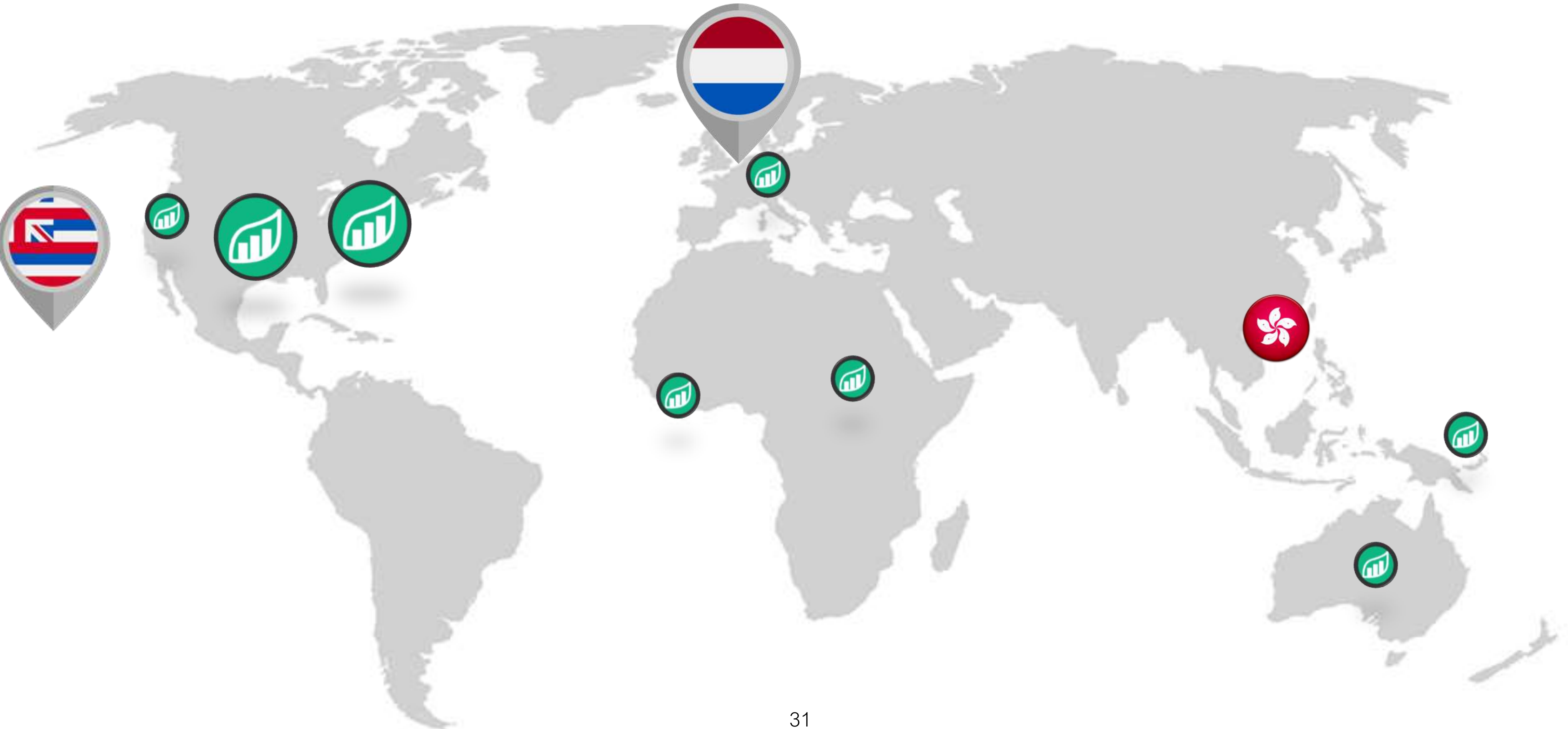
**PLANT FACTORY
(PFAL)
Version 5**



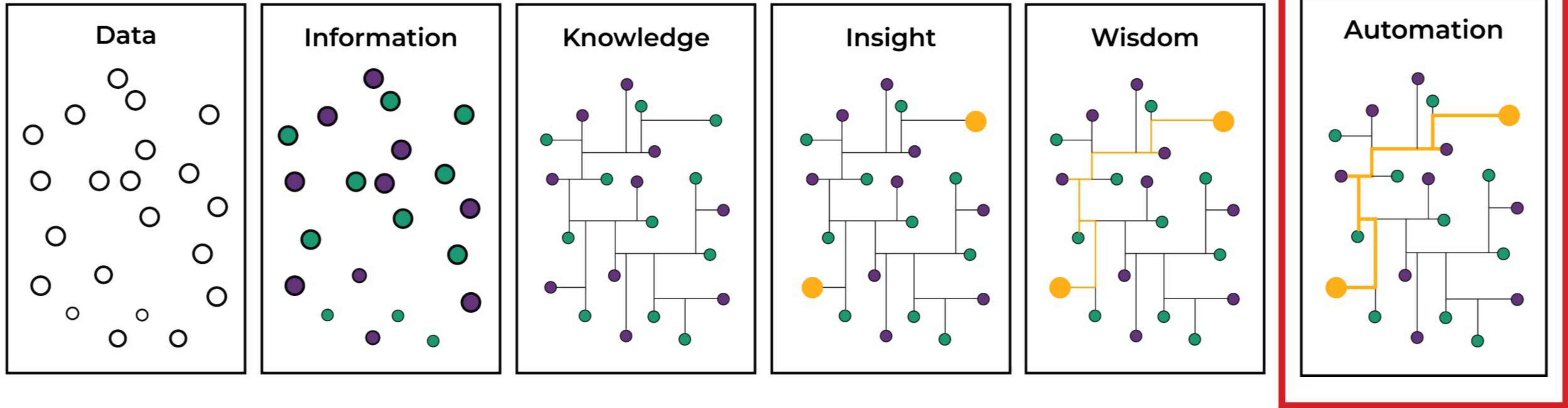
SYSTEMS INTEGRATION

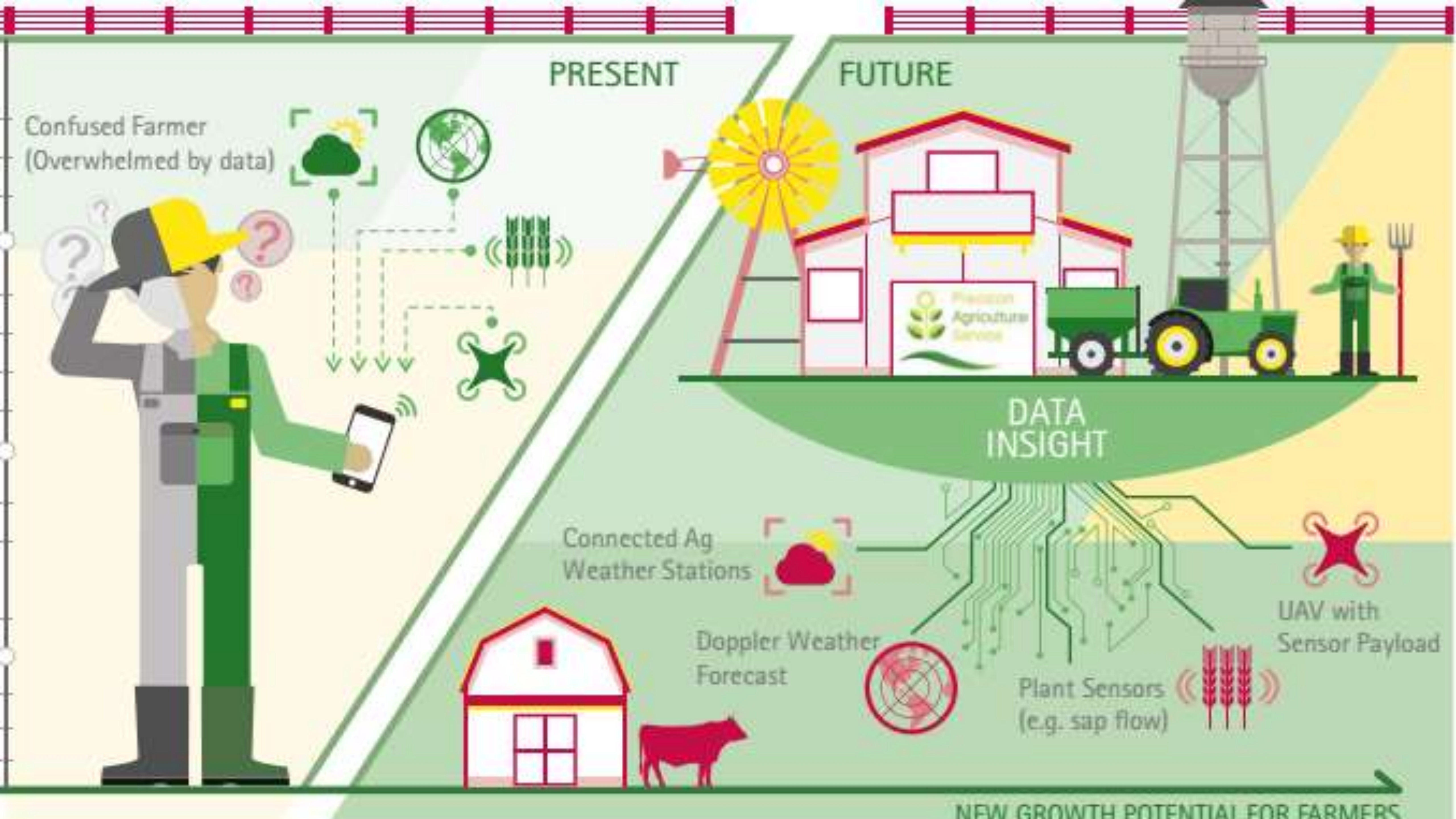


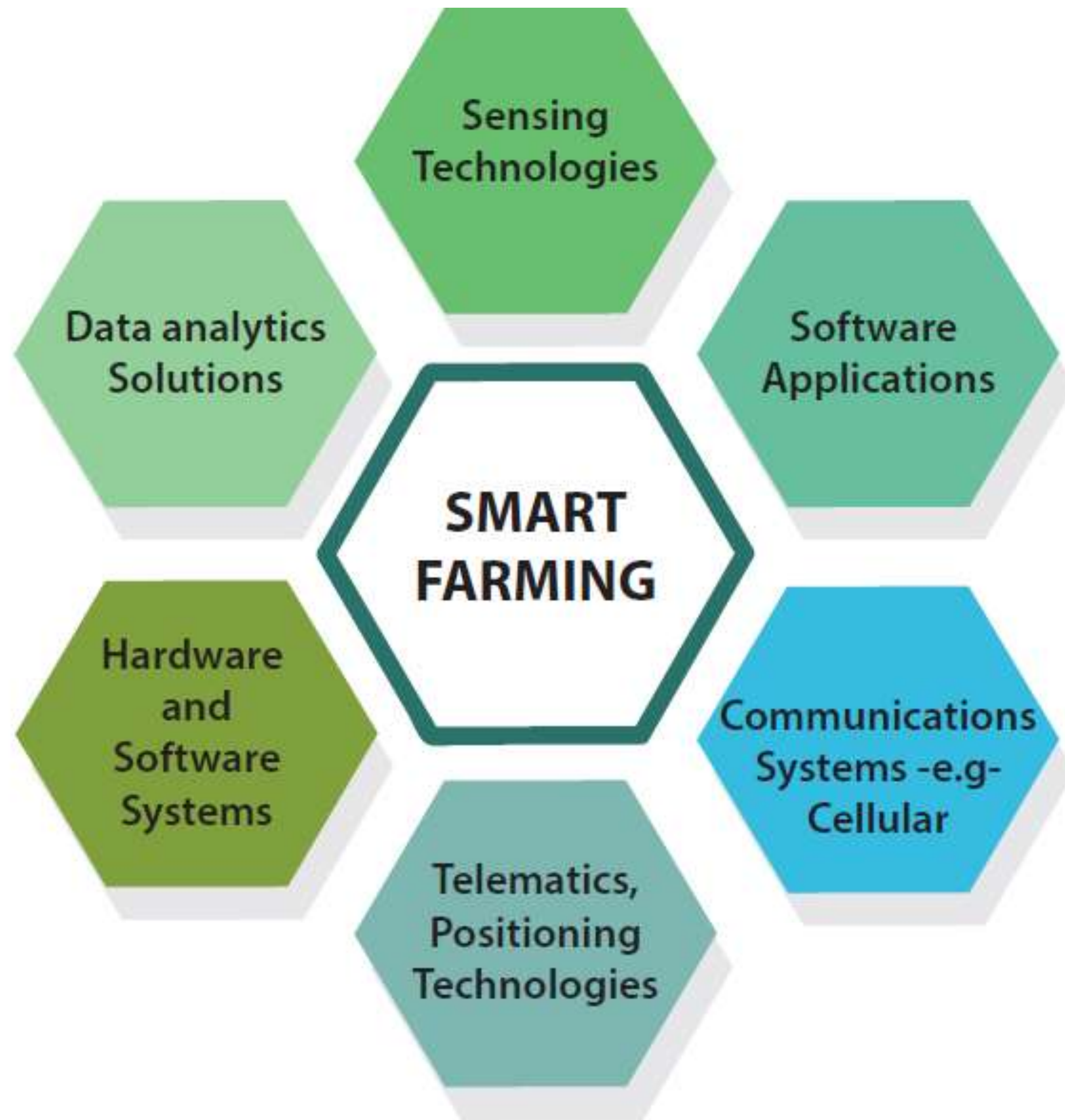
“A worldwide community of farmers to solve worldwide problems”



Data Cooperative for Small Farms







***Beecham Research
Smart Farming**



AG TECH: 100+ TECHNOLOGY COMPANIES CHANGING THE FARM

FARM MANAGEMENT SOFTWARE



NEXT GEN FARMS



PRECISION AGRICULTURE AND PREDICTIVE ANALYTICS



MARKETPLACES



ANIMAL DATA



ROBOTICS AND DRONES



SMART IRRIGATION



PLANT DATA/ANALYSIS



SENSORS





TECHNOLOGY ISN'T THE
ISSUE...

IT'S THE ADOPTION OF
TECHNOLOGY
THE HUMAN, CULTURAL,
SOCIAL BARRIERS



Farmers fear of the unknown (40 Chances)

Fear that their advantage will be lost (Zero Sum)

General distrust of tech providers

Concerns over data ownership and privacy



IT'S NOT A MATTER OF IF,
BUT WHEN TECHNOLOGY
FAILS







4 INFLUENCES OF TERROIR

CLIMATE



COLD



HOT



WINDY



FOGGY

TERRAIN



NORTH OR SOUTH
FACING

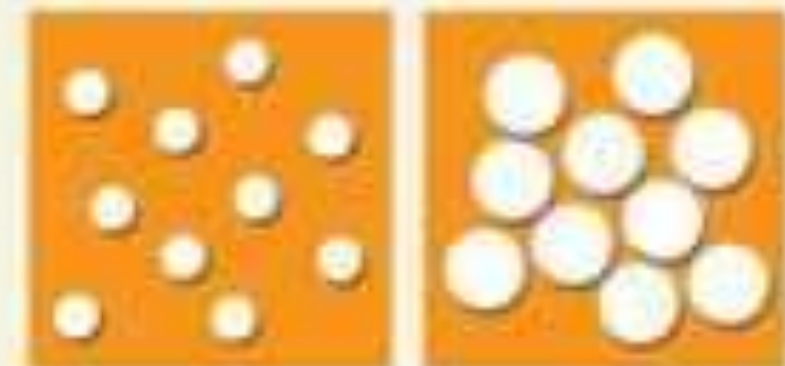


ELEVATION/
ALTITUDE

SOIL



ROCK + MINERAL DEPOSITS



DENSITY

TRADITION



TECHNIQUE + WINEMAKER

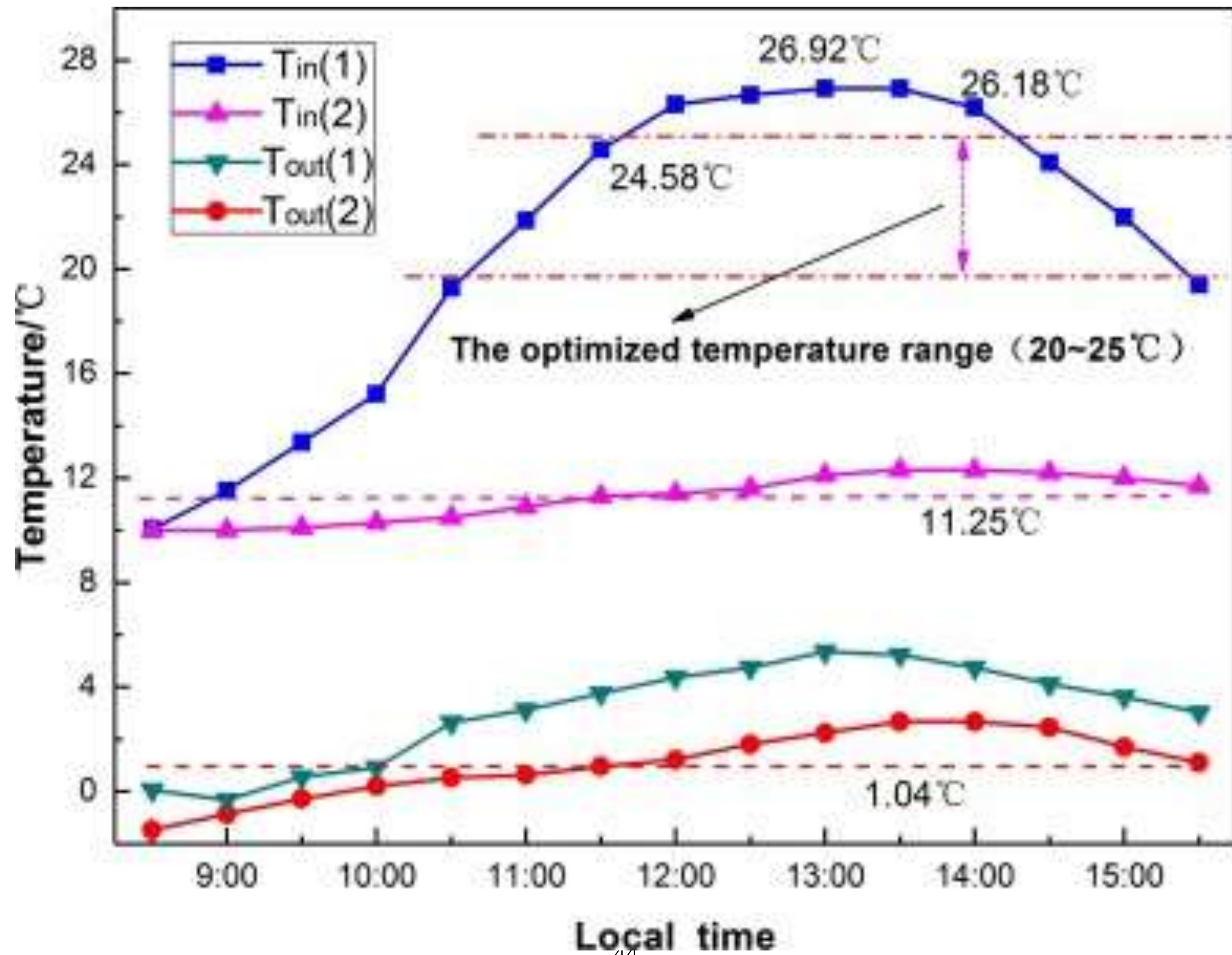


Recipes

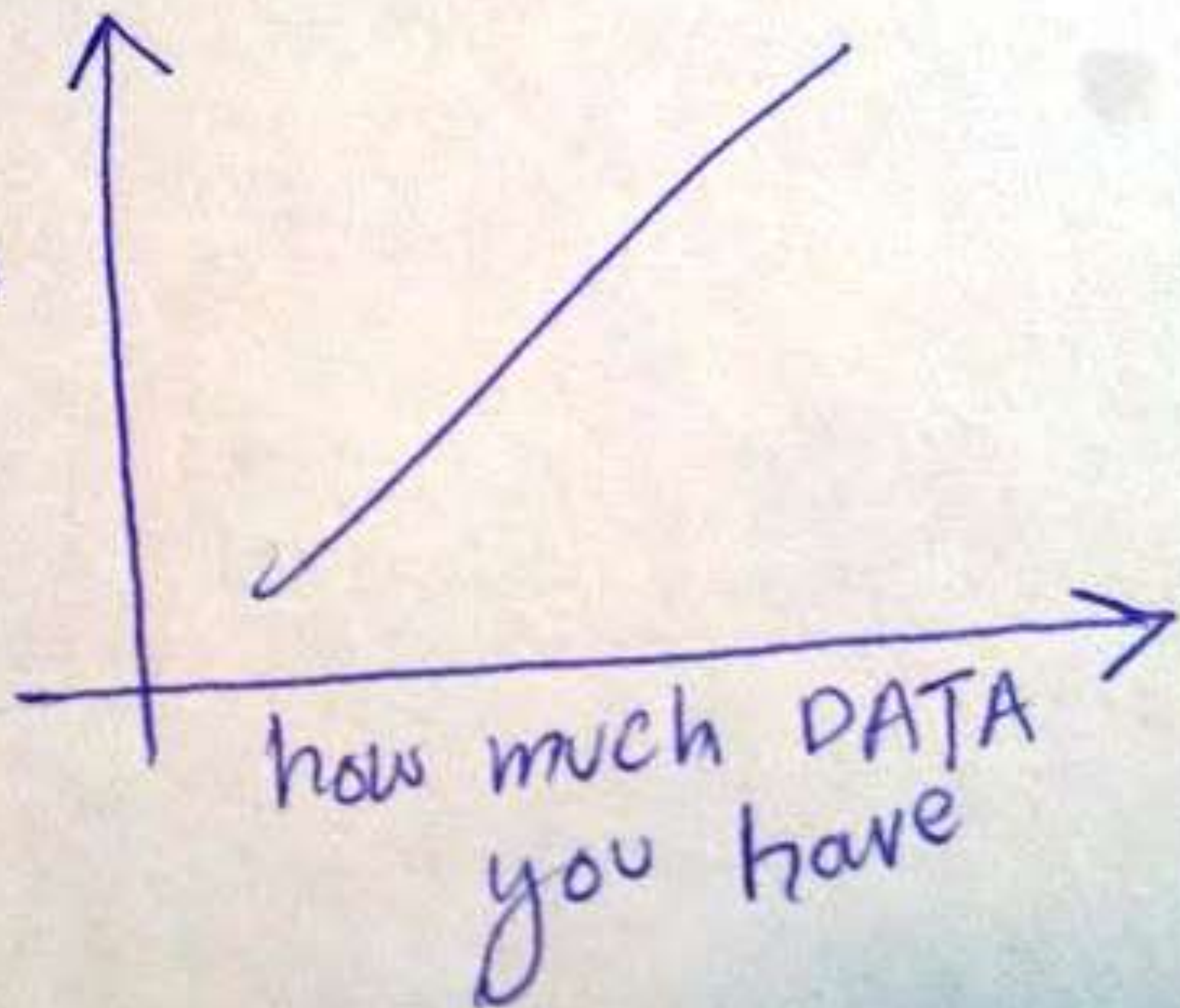
See both the quantitative and qualitative



IT'S ALL ABOUT MICROCLIMATES



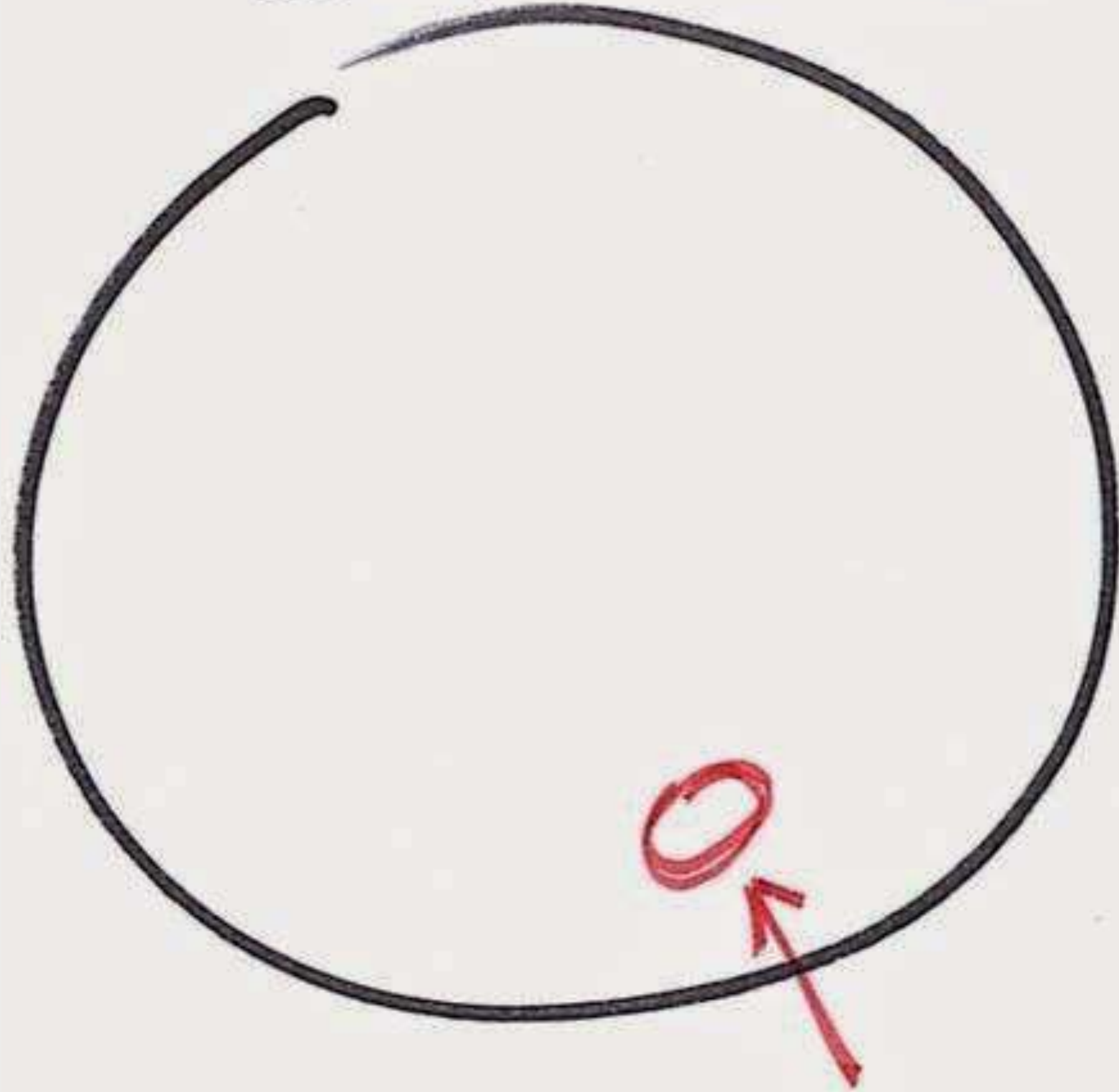
Confusion





DATA PARALYSIS BY ANALYSIS

All of the
Information.



What you really
Need to Know



IT'S ALL ABOUT ACTIONABLE INSIGHTS

Smart Yields: The Connector



Insights = Confidence = Better Decisions

Increase labor productivity and efficiency

Smart Yields Leverages Data

Insights from soil, topography and microclimates



A FRESH APPROACH TO AGRICULTURE



AGNOSTIC

Hardware is a commodity, being sensor agnostic, we aggregate data, overlaying public and private quantitative data.



COST EFFICIENT

We utilize technologies from Smart Cities, Automotive, and Telemedicine, bringing low-cost technologies not found in agriculture.



SIMPLE

We add value by focusing on the adoption of technology, providing a unique approach in allowing farmers to access actionable insights.

Our difference: we are hardware, connectivity, crop agnostic
We are a DATA AGGREGATOR

**ADD VALUE
TO STAKEHOLDERS**

**FARMER
FIRST**



B2B



Government

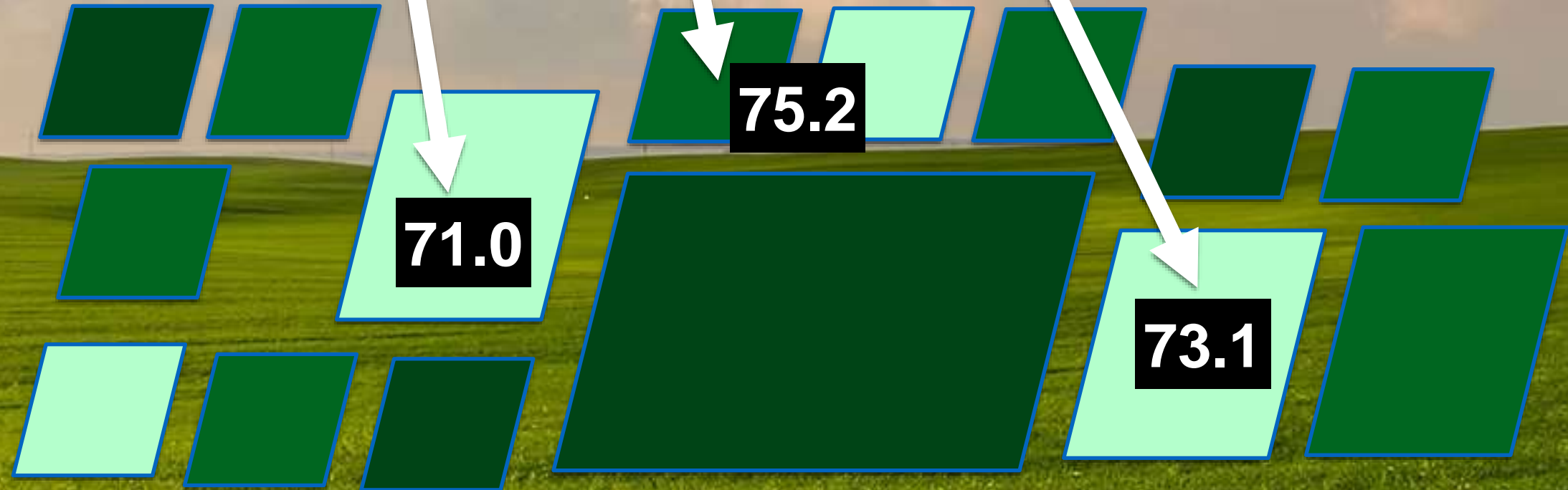


**MACHINE LEARNING +
AUTOMATION**



**GOVERNMENT
UNIVERSITY
COOP / UNIONS**

HARDWARE AGNOSTIC





Colorado Climate Collaborative Mitigating Late Frost



SMART YIELDS

CROP PROTECTION & YIELD ENHANCEMENT



**Rocky Mountain
Farmers Union**



“

A spring frost can kill the blossoms and make it hard to compete with orchards in mellow climates. Smart Yields triples the amount of time I had to save my Honeycrisp crop, worth hundreds of thousands of dollars.

Edward Tuft,
Owner, Leroux Creek Foods, Colorado

”



Sensor Network





Rocky Mountain
Farmers Union

“When Smart Yields technology is used in coordination with other farmers, it ceases to be solely about what is important at your farm, and it shows you what is important about conditions across many farms.”

Harrison Topp - RMFU



Mitigating Weather Damage & Saving Crops: Smart Yields at 5,500 Feet in Colorado

Edward Tuft founded Leroux Creek Foods more than 30 years ago in Western Colorado, in what today spans nearly 500 acres of certified organic orchards in the heart of the snow-capped Rocky Mountains. He's no stranger to the early- and late-season frosts that can cost growers here millions in losses of high-value crops such as apples, cherries, peaches and plums.

A pioneer in flavored apple sauce products, Leroux Creek Foods processes and packages millions of pounds of apples each year for Leroux Creek and private-label snacks and baby foods. The company has up to 70 employees throughout its operations.

In this area around Hotchkiss, Colo., orchards start at nearly 5,500 feet in elevation, with nearby growers producing crops up to 7,600 feet.

“A spring frost can kill the blossoms and make it hard to compete with orchards in mellow climates, such as Washington State,” Edward said. “I had been looking for an effective, affordable crop monitoring system for nearly a decade when I found Smart Yields.”



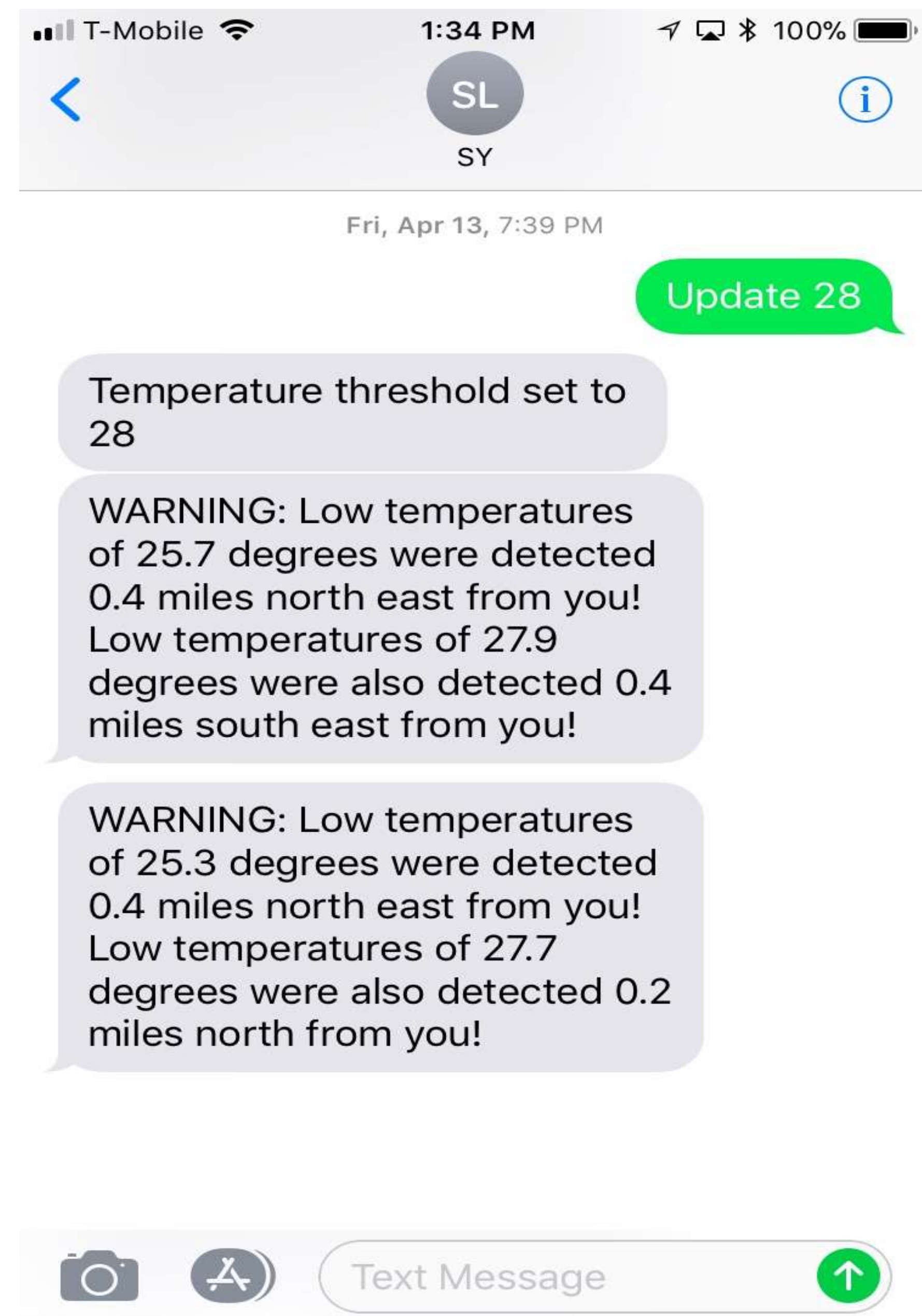
Situation

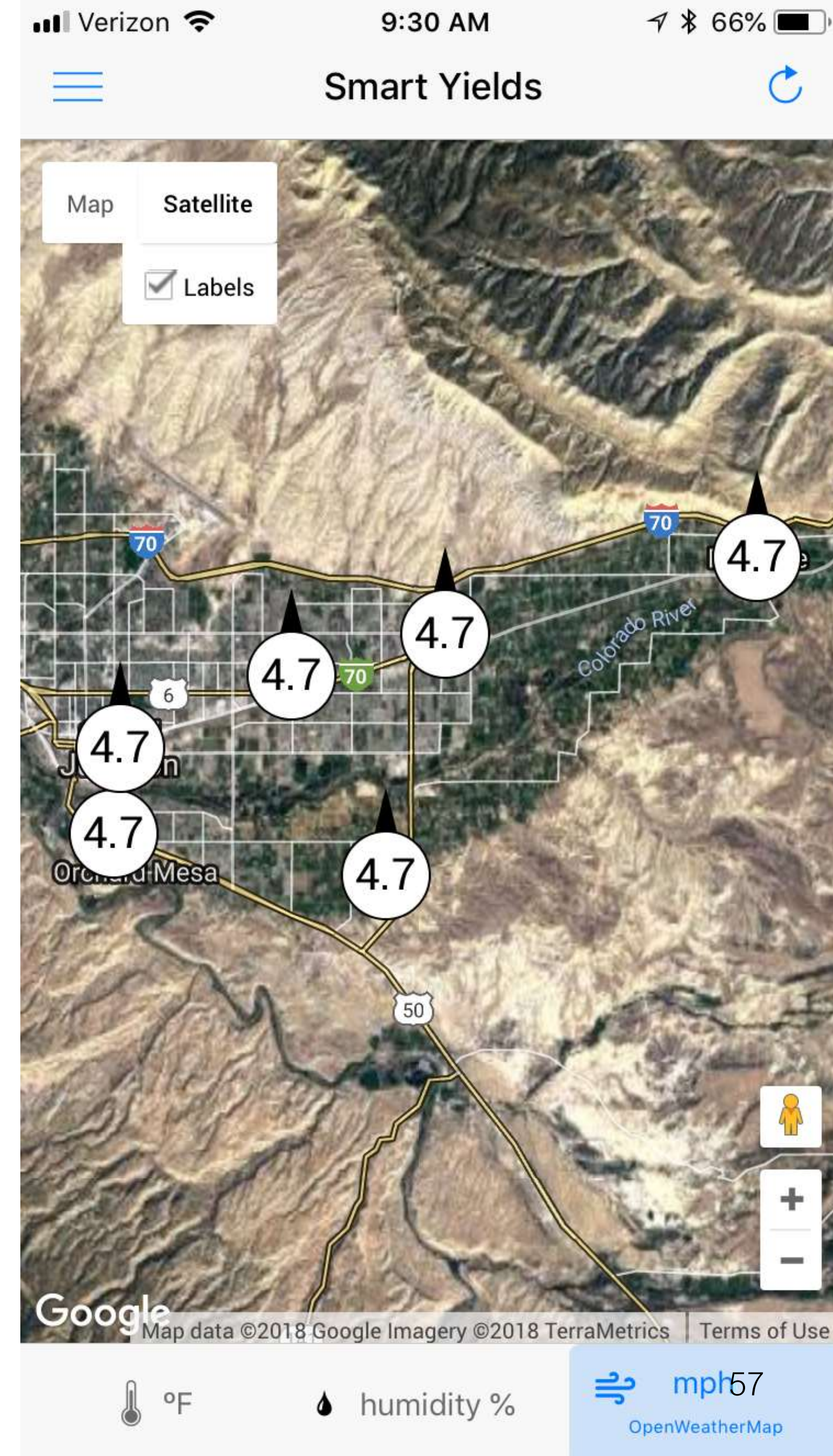
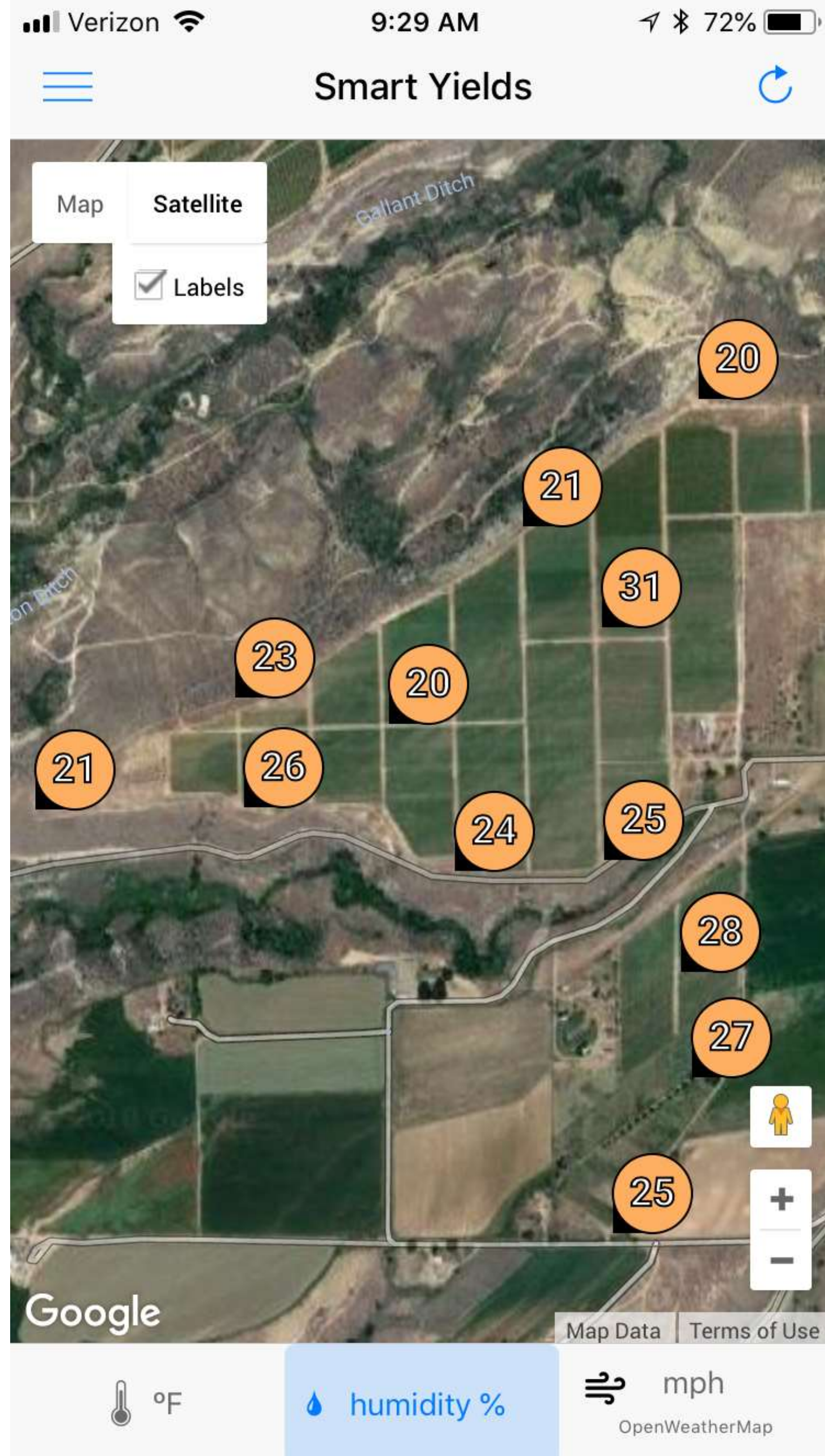
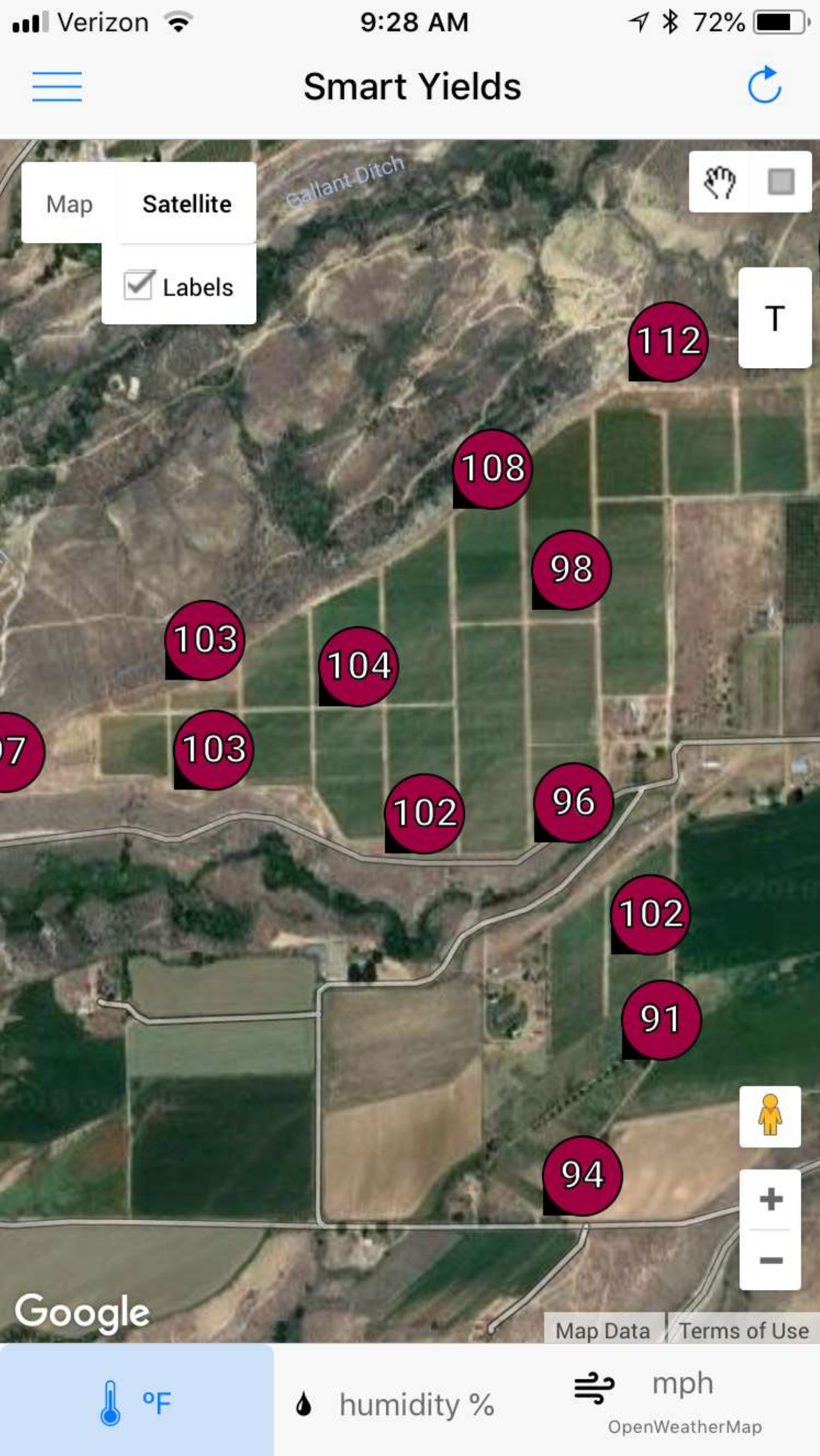
Apple, cherry, peach and plum growers in high-altitude areas of Colorado face early- and late-season frosts that kill these high-value crops.



Solution

Smart Yields wireless monitoring stations alert farmers to issues in real time, allowing them to activate heating systems in the most critical areas.





WHAT DID WE LEARN?

By Monitoring Temperature



“Saves us time, we don’t get out of bed”

“Workers can work next day” - Saving Labor

“When we turn on machines - Saving Fuel”

Harvest Prediction (GDD) - Labor Efficiency

“When will pests migrate” (Biofix)— Saving Money

“Which varieties should we grow”

“Farm design – wind machines, irrigation etc”



“In Allah we trust.
All others must bring
data.”

W. Edwards Deming



Marshall Islands

Monitoring rising sea levels + workforce
development for food security

Kunia Ag Park

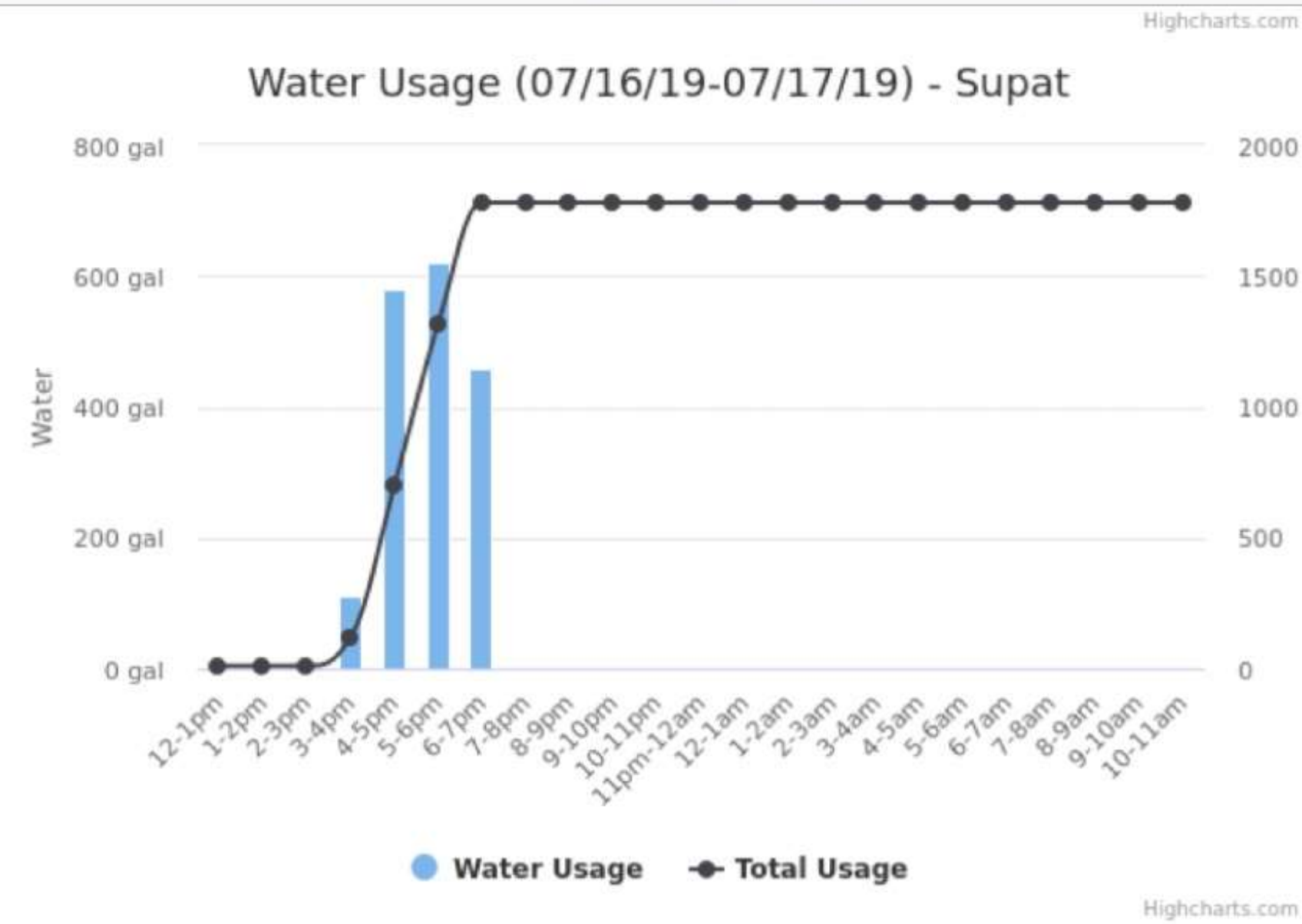


T-Mobile

6:39 AM

< 82

Smart Yields Alerts >



Water Usage (07/16/19-07/17/19) -





FOOD VALUE CHAIN MODELS

Chain-Wide Learning for Inclusive Agrifood Market Development

A guide to multi-stakeholder processes for linking
small-scale producers to modern markets



Sonja Vermeulen
Jim Woodhill
Felicity Proctor
Rik Delnoye

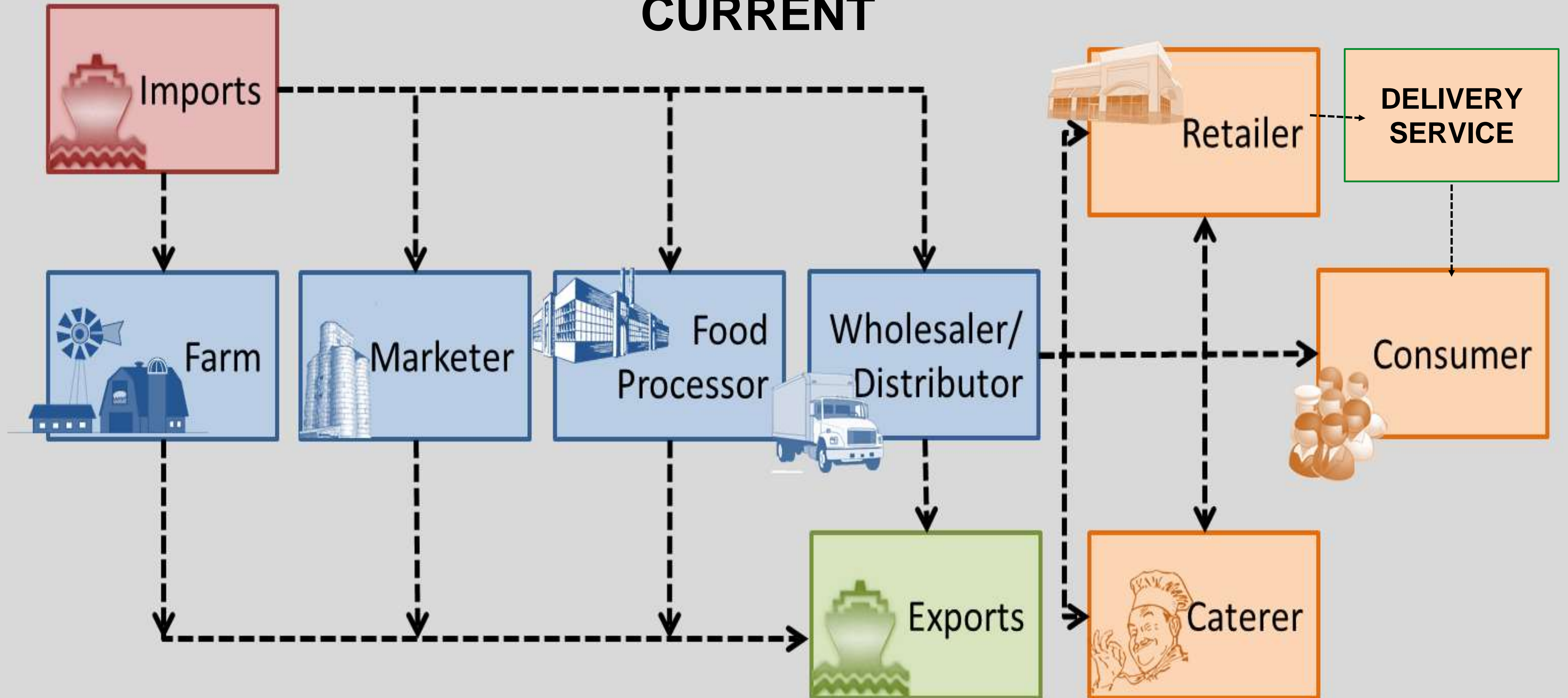
iied
International
Institute for
Environment and
Development

WAGENINGEN UR
For quality of life

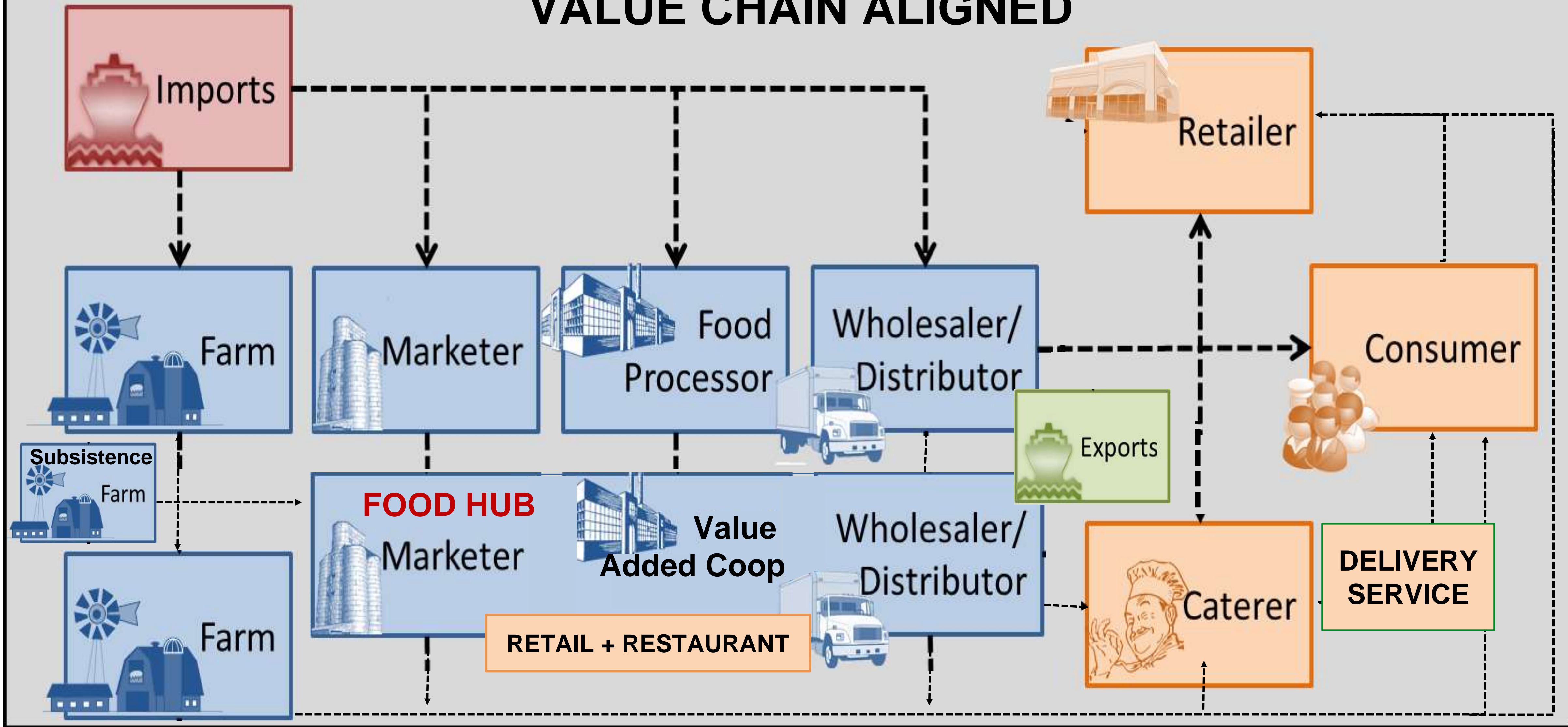
Regoverning Markets
Inclusive and sustainable market systems



CURRENT



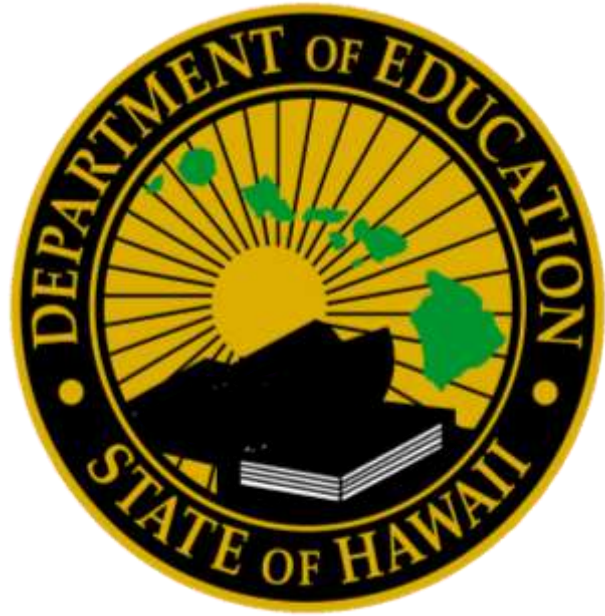
VALUE CHAIN ALIGNED



FARM 2 FOODHUB

Current Food Hub Impact

Eight existing food hubs in Hawai'i



Served All DOE
Schools



Supply 7
Hospitals



200 Restaurants
& Hotels



1,000
Families



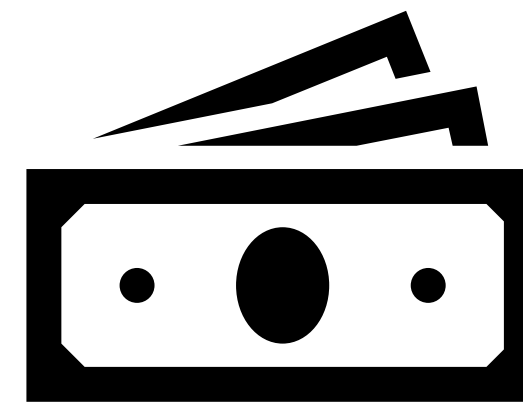
64 Full & Part
Time Jobs



660 Small-
Medium Farms



2250+ Unique
Customers



\$2.7M Annual
Revenue



**COLD CHAIN
AGGREGATION
INSTITUTIONS
EXPAND MARKETS**

EDUCATION

**HOGESCHOOL: VOCATIONAL UNIVERSITY
GREENHOUSE RESEARCH
EXPO**





FARM APPRENTICE MENTORING PROGRAM



5 Month Certificate Program



SOIL HEALTH INITIATIVE

COVER CROP CARBON &
DEMONSTRATION NUTRIENTS



VALUE ADDED FOOD



**HIGHER MARGINS
REDUCE FOOD WASTE
EXPORT MARKET**

Hawai'i Farmers Union United

ONLINE ANNUAL CONVENTION



4 DAYS: NOVEMBER 12-15 2020
VIRTUAL INTERACTIVE EXPERIENCE
"Celebrating Hawai'i Agriculture"

KEYNOTE PRESENTERS & LIVE PANELS

Paul Stamets Dr. Elaine Ingham Ray Archuleta John Liu Joel Salatin
 Bill Richmond Jeff Moyer Sam Ka'ai Dr. Zach Bush Sandor Katz

INTERACTIVE BREAK-OUT SESSIONS w Q&A

Doug Fine Peter Salleras Sandy Syburg Glenn Martinez Mark Damon Saleh Azizi Brynn Foster
 Nāhealani Breeland Charles Tressidder David Fisher Evan Ryan Steve Sakala Gail Bryne-Baber
 Teresa Young Dana Shapiro Ray Maki Janel Ralph Cab Baber Travis Thomason Chad Chereffko
 Iginia Boccalandro Mark Lewis Dave Brandt John Cadman Ron Kennedy Alfred Grand
 Kevin Kelly Gerry Ross Drake Weinert Don Heacock Greg Smith Sasha Leitner Dr. Paul Hepperly

HFUU MUSIC & FARMER BENEFIT CONCERT

Jack Johnson Edie Brickell Willie Nelson & the Boys Lukas Nelson & POTR Michael McDonald
 Mike Love Particle Kid Tavana Makana Drew Martin Gail Swanson Flea Pat Simmons Sr. & Jr. Paul Izak
 Marty Dread Daniel Lanois Josh Klinghoffer Rocco de Luca George Kahumoku Jr. Emily Turner & Others

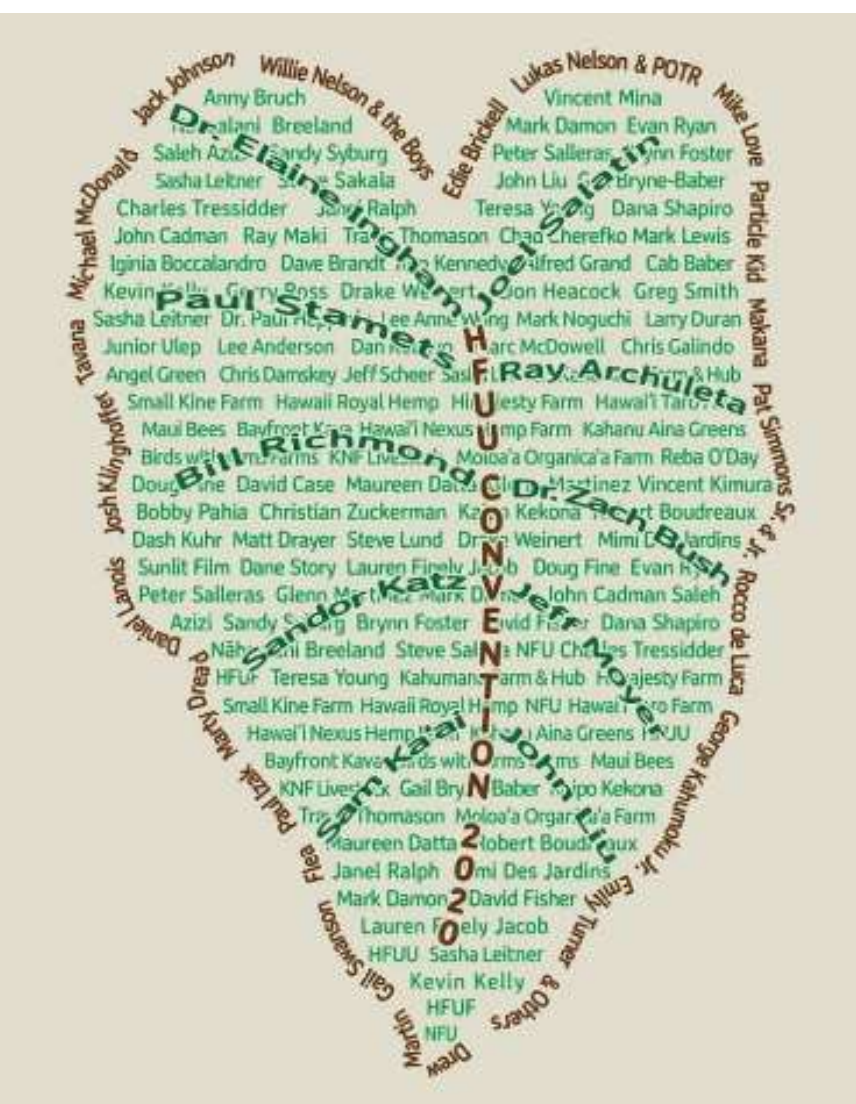
HAWAII CHEF DEMO SESSIONS

Lee Anne Wong Mark Noguchi Larry Duran Junior Ulep Lee Anderson Dan Robayo
 Marc McDowell Chris Galindo Angel Green Chris Damskey Jeff Scheer Sasha Leitner

HAWAII HEROES FARM TOURS

Kahumana Farm & Hub Small Kine Farm Hawaii Royal Hemp Himajesty Farm
 Hawai'i Taro Farm Hawai'i Nexus Hemp Farm Kahanu Aina Greens Maui Bees
 Birds with Arms Farms Bayfront Kava KNF Livestock Moloka'a Organica's Farm

Join Us for this Global Event. Registration & Details at HFUU.ORG



WWW.HFUU.ORG

HAWAII FARMERS UNION UNITED

10th-Annual Convention

NOVEMBER 12-15, 2020

Experience the ALOHA from Where You Are



SOMETHING FOR EVERYONE WHO
 VALUES LOCAL AGRICULTURE



Joel Salatin



Dr. Elaine Ingham



Paul Stamets



Willie Nelson & the Boys

Cover Crop Panel of Experts
 Exploring the Microbiome
 Soil Food Web Management
 Natural Farming Techniques



Aquaponics 101
 Hemp Production
 Hawaii Cuisine Demos
 and so much more

We welcome our ACRES USA friends to be part of this special virtual celebration of agriculture. Be inspired and engaged with interactive sessions featuring multiple farming aspects, chef-led demos, local farm tours, and performances with notable national and local musicians interwoven with Hawaii farmers.

Willie Nelson - Edie Brickell - Lukas Nelson - Particle Kid - Daniel Lanois - Rocco De Luca - Makana - Mike Love - Tavana - Paul Izak - Marty Dread and many more!

Sponsorships Available

Register
 today for this
 exciting three-day
 virtual experience
 and receive a
FREE memento from
 Hawaii.

membership@hfuuhi.org



JACK



WILLIE
&
THE BOYS



JESSE



MIKE



GAIL



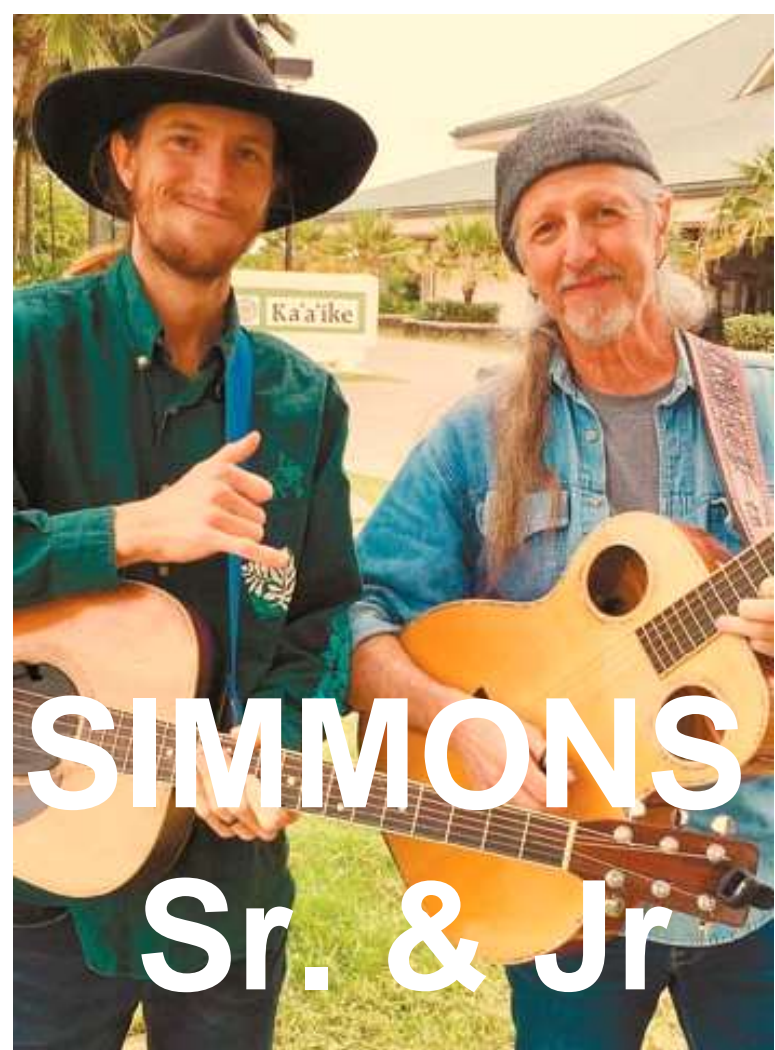
FLEA



TAVANA



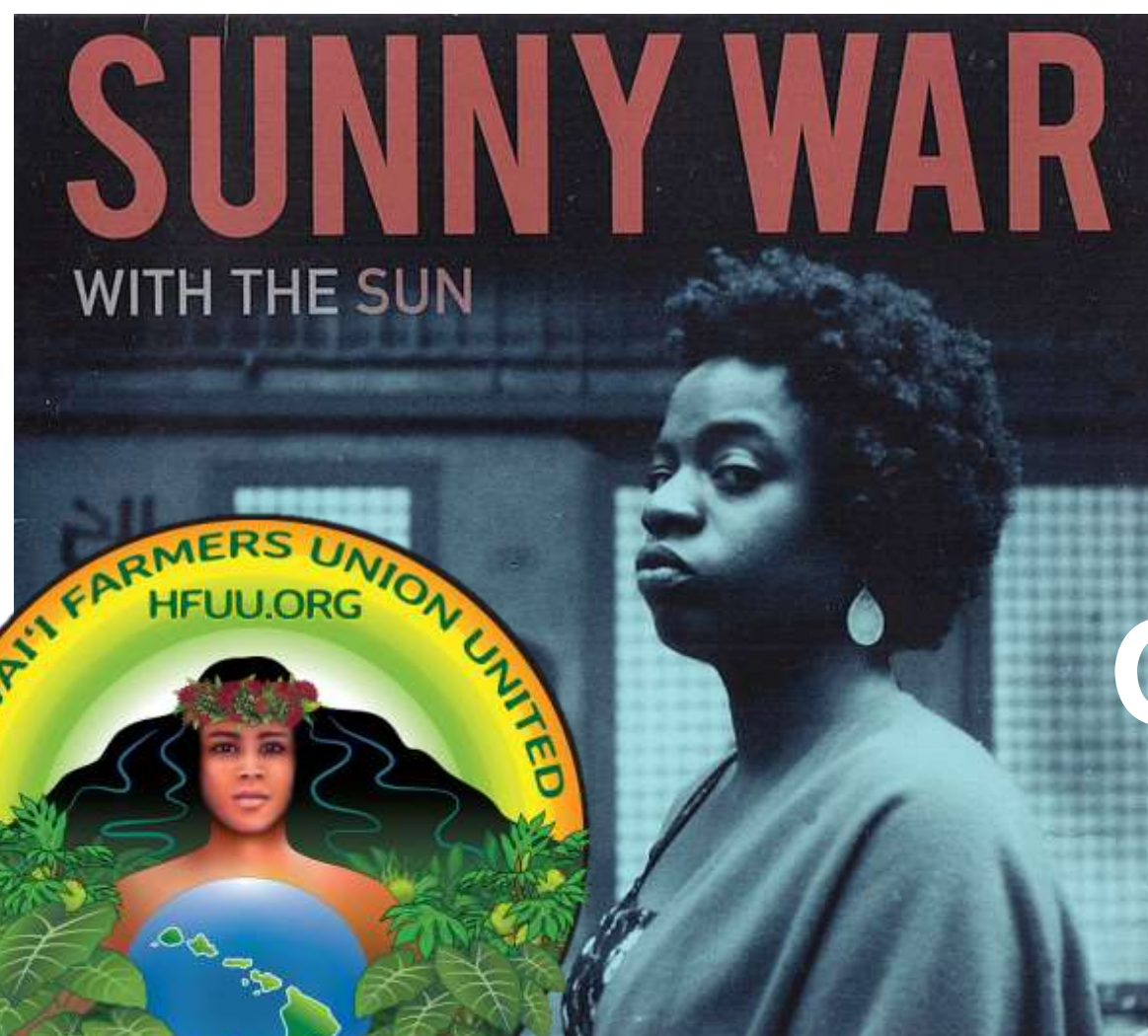
EMILY



SIMMONS
Sr. & Jr



EDIE



SUNNY WAR
WITH THE SUN



GEORGE



DREW



ROCCO



MAKANA

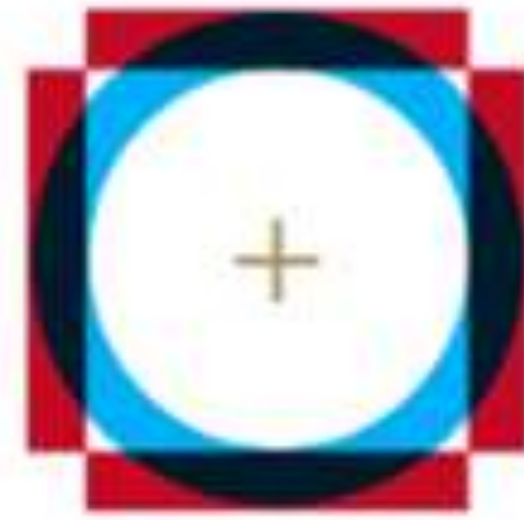
NOVEMBER 15
TO BENEFIT HAWAII FARMERS

HAWAII THEATRE.COM & OTHERS

INNOVATION



ELEMENTAL
ACCELERATOR



Laudato Si'
Challenge



Accel^{VT}

數碼港
Cyberport

**SOCIAL IMPACT
CONSCIOUS CAPITALISM
EARLY / GROWTH ACCELERATORS**



UN GLOBAL COMPACT
LEADERS SUMMIT



Dr. Philip Thigo

Senior Director of Africa
Thunderbird School of Global
Management



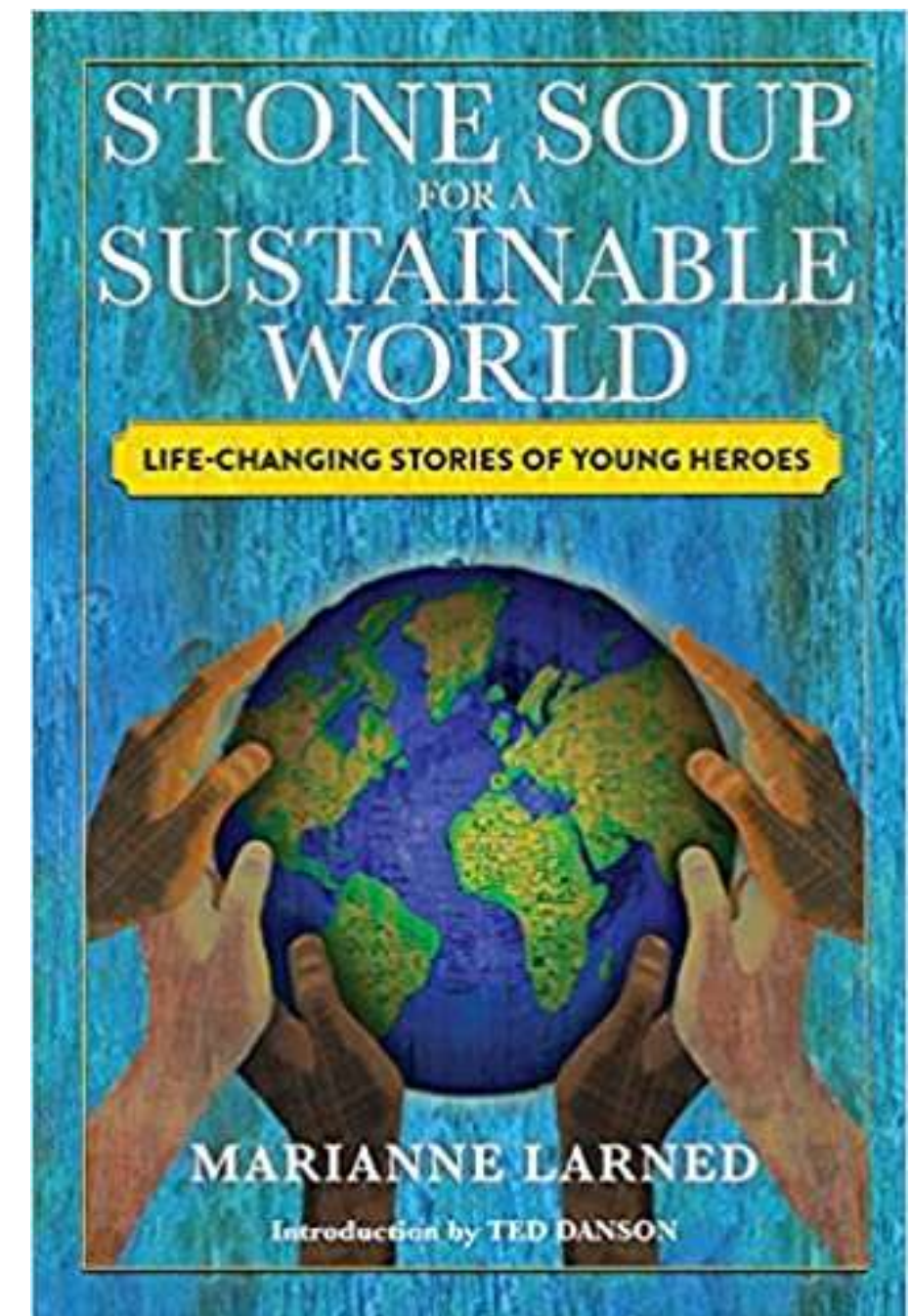
Vincent Kimura

Lead Founder & CEO
Smart Yields



Elysabeth Alfano

Founder
Plant Powered Consulting



**Release:
June 17, 2021**

MAHALO



[linkedin.com/in/vincentkimura/](https://www.linkedin.com/in/vincentkimura/)

15–16 JUNE 2021

#LeadersSummit

REGISTER TODAY