



BUILDING A CLIMATE FRIENDLY SAN DIEGO FROM THE GROUND UP

This report is intended for policy makers, farmers & ranchers, and all interested San Diegans. It introduces the benefits and opportunities of carbon farming, and highlights the important role that San Diego County agriculture can play in reducing the causes of climate change and building a climate resilient region.

May 2018



THE CHALLENGE:

Climate Change in the County of San Diego

Climate change is presenting challenges to San Diego County that impact every sector of our society and economy.

Agriculture faces distinct climate-related challenges.

THE GOOD NEWS:

Agriculture can also be the source of solutions that will benefit everyone.

Climate-smart agriculture, also known as **carbon farming**, can help farmers, ranchers, and the region as a whole overcome some of the challenges of climate change while also reducing its causes.

Climate change is caused by greenhouse gases (GHG's), such as:

CO_2
CARBON DIOXIDE

CH_4
METHANE

N_2O
NITROUS OXIDE

and others that trap heat in the atmosphere.

GHG emissions come from burning fossil fuels for transportation and electricity, producing and using synthetic fertilizer, landfill fermentation, and several other sources.

TACKLING CLIMATE CHANGE HAS 2 PARTS:

MITIGATION:

Slowing down climate change
by reducing its causes



RESILIENCE:

Maintaining key processes
and bouncing back in the
face of climate challenges



CLIMATE-SMART AGRICULTURE CAN HELP US DO BOTH.

In San Diego County, GHG emissions are produced by many sectors. The County of San Diego's Climate Action Plan (CAP), consistent with California-wide mandates, sets targets, strategies and timelines for **mitigating** GHG emissions in the unincorporated county.

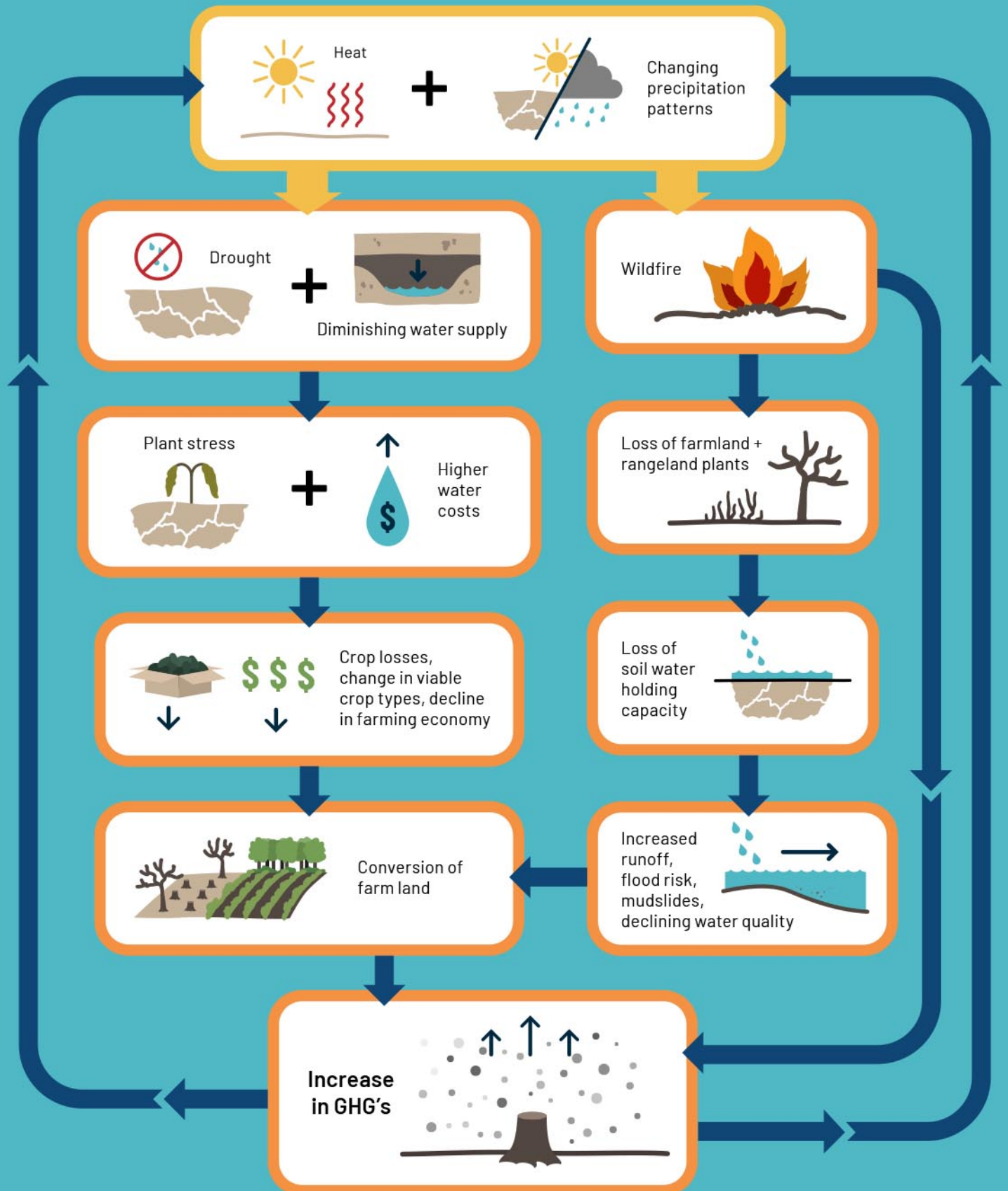


EMISSIONS FROM AGRICULTURE = 5%

(This accounts for agricultural machinery use, livestock emissions, + fertilizer use.)

CLIMATE CHANGE CHALLENGES FOR AGRICULTURE

can lead to even greater GHG emissions.



A SOLUTION:

The Multiple Benefits of **Carbon Farming**

ON ONE HAND...

excessive carbon pollution
in the atmosphere is
causing climate change.



.....

ON THE OTHER HAND...

carbon is the substance
that all living things
are made of.



CARBON FARMING (or climate-smart agriculture)

is a set of farming and ranching practices that build soil carbon, turning carbon pollution in the atmosphere into the forms of carbon that build and nourish living things.

THERE ARE OVER 30 CARBON FARMING PRACTICES.

Examples include:

- Permanent crops such as orchard trees, bushes, and vines
- Compost application to croplands and rangelands
- Riparian restoration with perennials
- Windbreaks and hedgerows
- Mulching
- Cover cropping
- No-till or low-till row crops
- Silvo-pasture, or grazing lands that include trees

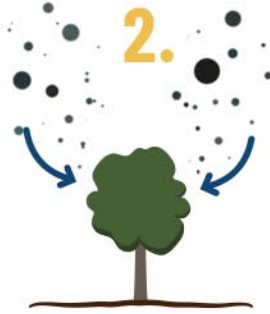
THE MITIGATION BENEFITS OF CARBON FARMING

Carbon farming practices reduce levels of GHG's in the atmosphere.

They do this in 3 ways:



They reduce activities that cause GHG emissions, such as tilling, or using synthetic fertilizer.



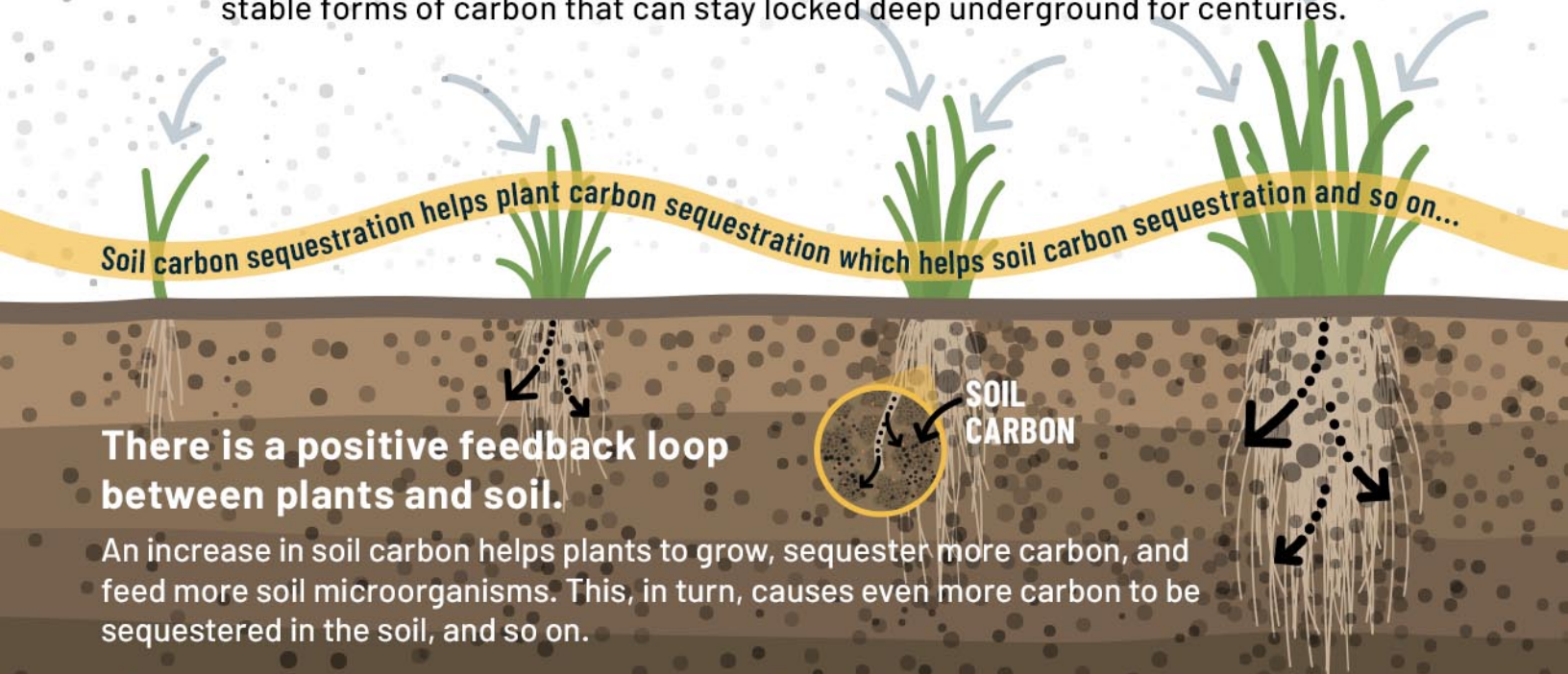
They help plants grow, which locks in, or **sequesters** carbon for the lifetime of the plant.



They **sequester** carbon in the soil in forms such as soil *humus*.

WHAT IS SEQUESTRATION?

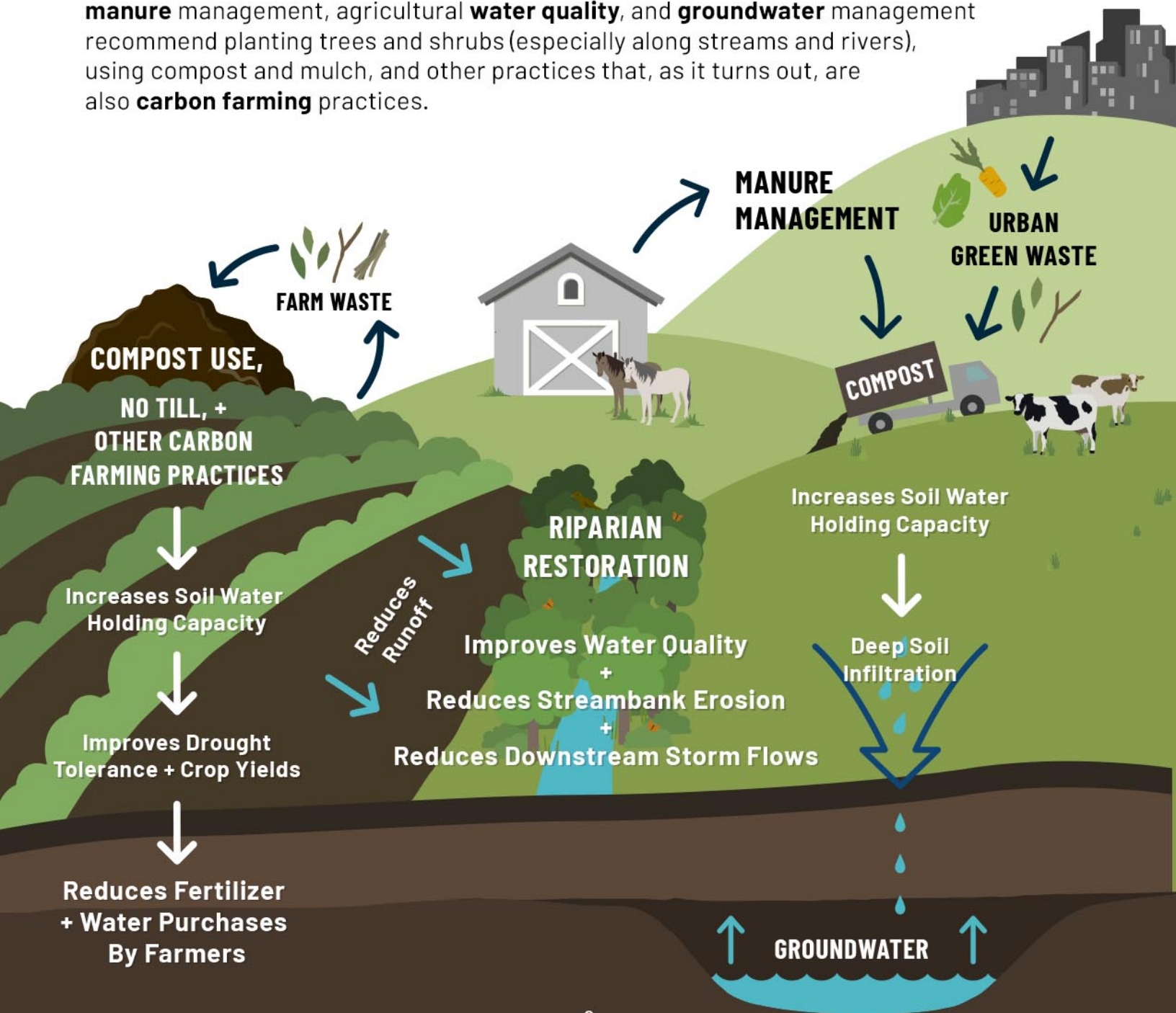
Plants **sequester** carbon when they take in carbon dioxide and convert it into wood, roots, and other plant parts. As they grow, they produce liquid carbohydrates which flow through their roots and, with the help of microorganisms in the soil, turn into stable forms of carbon that can stay locked deep underground for centuries.



THE RESILIENCE BENEFITS OF CARBON FARMING

Carbon farming practices **are beneficial for farmers**, and also build **climate resilience**. They prevent **erosion**, increase **soil fertility**, and improve the soil's ability to absorb and hold **water**. These benefits support several County-wide efforts and will become increasingly important as climate change progresses.

In fact, "best management practices" for **storm water** reduction, **erosion** control, **manure** management, agricultural **water quality**, and **groundwater** management recommend planting trees and shrubs (especially along streams and rivers), using compost and mulch, and other practices that, as it turns out, are also **carbon farming** practices.



SNAPSHOT: AGRICULTURE

One of San Diego County's Top 5 Economic Industries

CONTRIBUTES OVER \$2.8 BILLION
annually to local economy



San Diego County has more
SMALL FARMS & CERTIFIED ORGANIC FARMS
than any county in the U.S.

PERMANENT CROPS*
68%

CROPLAND
50,846 acres

NURSERY/
ORNAMENTALS
24%

ROW CROPS
8%

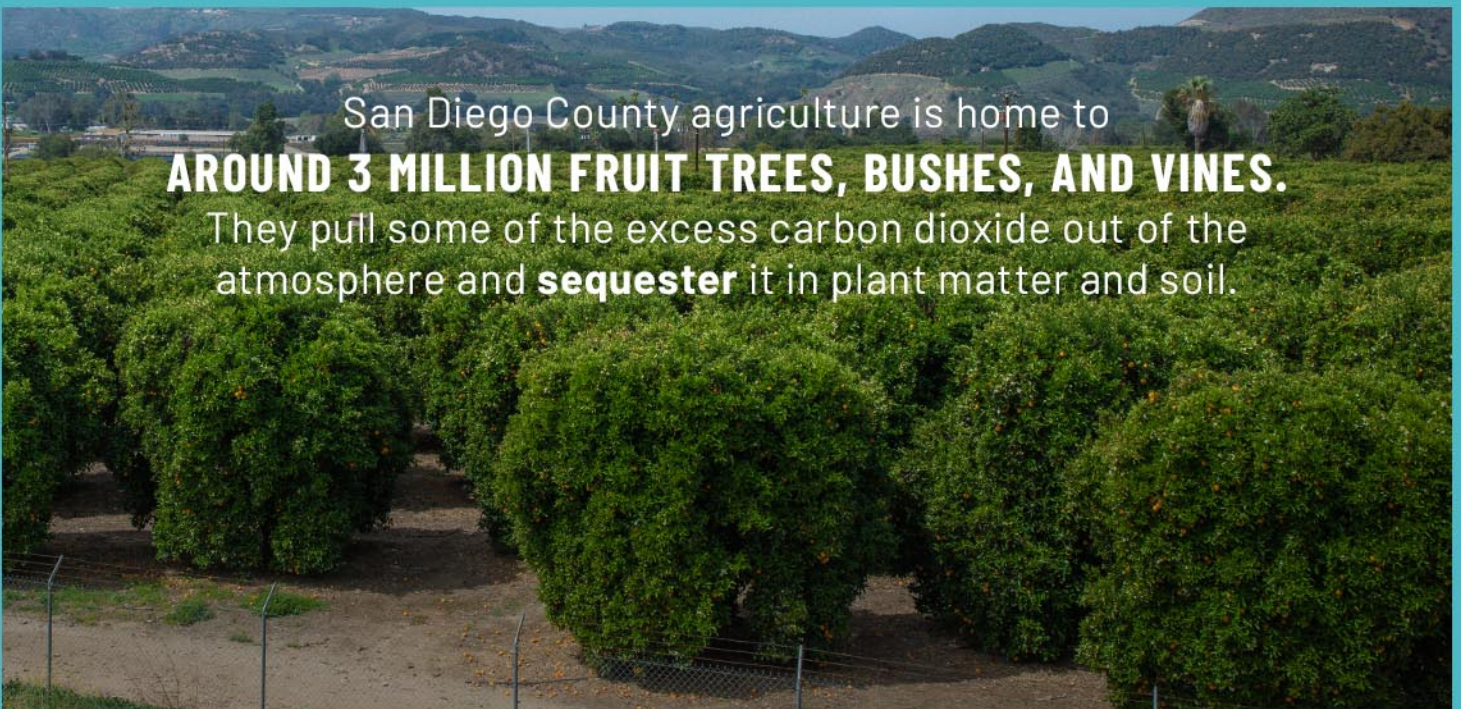
RANGELAND
200,301 acres

*fruit and nut trees, bushes, and vines

MORE FACTS ABOUT SAN DIEGO COUNTY AGRICULTURE

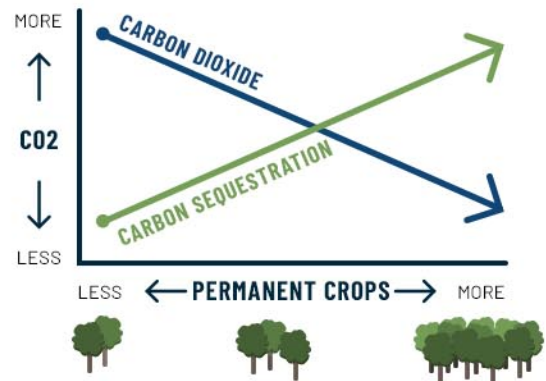


The average age of a San Diego County farmer is 62 years old. Younger farmers are largely **FIRST-TIME FARMERS**, learning the skills of a new profession.



San Diego County agriculture is home to **AROUND 3 MILLION FRUIT TREES, BUSHES, AND VINES.** They pull some of the excess carbon dioxide out of the atmosphere and **sequester** it in plant matter and soil.

When trees are removed, carbon dioxide is released, sequestration stops, and we lose an important source of **CLIMATE MITIGATION.**



MITIGATION POTENTIAL

of Carbon Farming in San Diego County

Almost 70% of croplands in San Diego County are planted in permanent crops – millions of fruit trees, bushes, and vines that continuously perform the invisible service of combating climate change by sequestering carbon.

BETWEEN 2000–2015...

25% OF ORCHARDS



X 1 MILLION



CLIMATE IMPACT:



THE EQUIVALENT OF TAKING
OVER 64,000 CARS OFF THE
ROAD FOR A YEAR.

WERE TAKEN OUT OF PRODUCTION,
largely due to the rising cost of water.

Over 300,000 MTCO₂e*



In other words, in our permanent crops we have a strong foundation of carbon farming already. Keeping agriculture viable by reducing the cost of farming can help strengthen that foundation, helping us neutralize GHG emissions and meet the challenges of climate change.

* MTCO₂e, or metric tonnes of carbon dioxide equivalents, is a standardized measurement for GHG's, which allows us to make side by side comparisons of how different activities and strategies affect climate change.

CARBON FARMING PRACTICES:

COMPOST

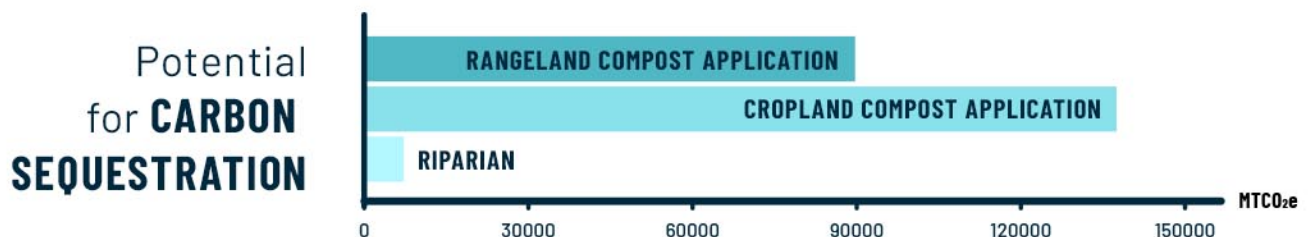
San Diego County's Climate Action Plan has committed to reducing the amount of green waste that gets sent to landfills, and turning it into compost instead. This will take a big bite out of methane emissions.

If all of that compost were applied to **crop** and **rangelands** in the unincorporated areas of San Diego County, we could reduce even more emissions by sequestering up to **227,000 MTCO₂e** every year, for several decades to come.



RIPARIAN* RESTORATION

Restoring **25% of unincorporated county riparian areas** can sequester over **7000 MTCO₂e per year**, and has multiple resilience benefits.



Carbon farming can help us meet our **climate action** targets to reduce GHG's.

* Riparian areas run along the banks of streams and rivers, where native trees, shrubs, and other vegetation play an important role in the health of the waterway.

MOVING FORWARD:

Building a Mutual Partnership to Tackle Climate Change and Strengthen San Diego Agriculture

The County has much to gain by partnering with farmers and ranchers to scale up carbon farming. As we face increasing temperatures, wildfire risk, and unpredictable precipitation, the costs of farming are also increasing. Climate-smart agriculture can help farmers overcome these challenges, and build climate resilience and mitigation for the entire county.

There are **three important strategies** by which the County can help scale up carbon farming and move toward a **climate smart region**. They would be best developed by a

CARBON FARMING TASK FORCE

that includes **stakeholders** from **agriculture**, **local government**, **public utilities**, **nonprofit**, and **business**.



THE STRATEGIES:

1

Slow down the loss of our climate-friendly orchards by addressing root causes.

For example, greater water demand combined with increasing water prices pose a major hurdle to the profitability of farming in San Diego County. Solutions such as voluntary interruptible supply, and recycled water provided to agriculture at lower rates than potable water can be win-win solutions that can:

Improve the economic viability of farming, and help keep our carbon sequestering food plants in the ground



Reduce demand on our limited potable water supply



Repurpose water that is otherwise treated as a waste product and flushed out to the ocean



2

Create incentives that recognize the climate services provided by farmers who practice carbon farming.

There are some state and federal programs that help with the costs of implementing carbon farming, such as NRCS EQIP cost share program, California Air Resources Board's FARMER program, and CDFA Healthy Soils Program. The County can develop further incentives by providing the educational outreach and assistance needed to learn, implement, and profit from new practices. Some examples include:



A mitigation fund or a local carbon offsets mechanism to finance carbon farming

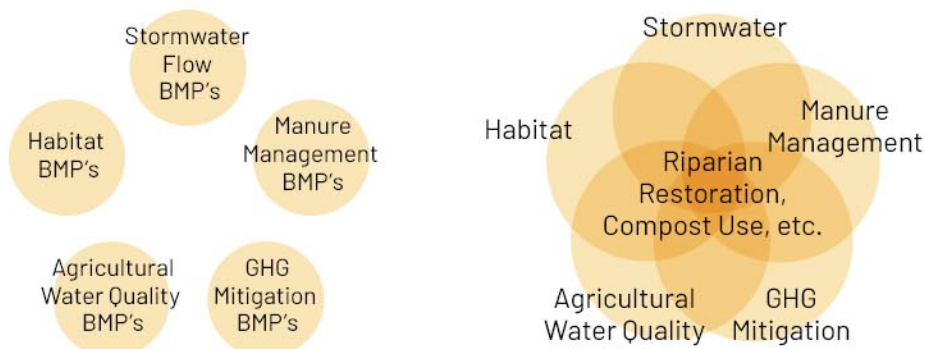


Facilitation of small businesses for production and distribution of high quality compost



A revolving loan fund to assist with implementation of carbon farming

Alignment of regulations so that they reward carbon farming. For example, ensuring that riparian species habitat creation will result in positive outcomes for a farmer, as opposed to added regulation, could encourage implementation of this climate-smart practice, which is also a best management practice (BMP) for several other programs.



3

Ease major barriers and enable the new generation of farmers and ranchers to succeed at building a future in climate-smart agriculture.

SOME MAJOR BARRIERS:

**CREDIT
& CAPITAL**

**BUSINESS &
MARKETING SKILLS**

WATER

TRAINING



This report was produced by San Diego County Farm Bureau, San Diego Food System Alliance, and Batra Ecological Strategies.

We would like to thank several organizations and individuals for their assistance:

Foundation for Sustainability and Innovation, for their financial support.

The Pauma Reservation and Solidarity farm for their time, assistance, and permission to photograph.

Several friends and colleagues for their feedback and insights.

Geoffrey Plagemann of Checkerboard Studios for photography.
www.checkerboardSTUDIOS.com

Michelle Uyeda for design and graphics.
www.michelleuyeda.com

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For More Information:

This report is a summary of our technical report, *Linking Climate-Friendly Farming Practices to San Diego County's Climate Action Plan: An Opportunity Analysis of Carbon Farming in the Unincorporated County*, which you can download from the San Diego Food System Alliance website: www.sdfsa.org and the San Diego County Farm Bureau website: www.sdfarmbureau.org

