



# Organic Farming: A Solution to Climate Change

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# California Certified Organic Farmers

Advance organic agriculture for a healthy world.

# What is Organic?

Organic farmers and ranchers follow federal standards and use holistic practices to promote balanced ecosystems.





**Organic practices improve soil health.**

## §205.202 Land Requirements

- Land used in certified organic production must undergo a three-year transition phase with no prohibited materials applied to it before it can be certified organic.

## §205.203 Soil Quality Standard

- Must implement tillage and cultivation practices that maintain or improve the physical, chemical, and biological condition of soil and minimize erosion
- Must maintain or improve soil organic matter

## §205.205 Crop Rotation Standard

- Must implement a crop rotation including but not limited to sod, cover crops, green manure crops, and catch crops that provide the following functions:
  - Maintain or improve soil organic matter
  - Provide for pest management
  - Manage deficient or excess plant nutrients
  - Provide erosion control

## §205.240 Pasture Standard

- The intent is to ensure that organic ruminant operations are pasture-based systems.
- All organic producers must graze ruminant animals on pasture for at least 120 days per year.





**Healthy soils combat climate change.**

# Carbon Sequestration

- Carbon sequestration is the process by which CO<sub>2</sub> is taken up by plants through photosynthesis and stored in biomass and soil.

science of healthy soil

healthy  
**soil is**  
made of about **45% minerals**  
**25% water**  
**5% organic matter** **25% air**

Source: *The Nature & Properties of Soils* page 17  
(Nyle Brady, Ray R Weil)



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Check out [www.nrcs.usda.gov](http://www.nrcs.usda.gov)



**Organic is a Solution to Climate Change**

# More Organic = Less Climate Change

- **Organic** practices build healthy soils and significantly **increase soil organic matter**.
- **Carbon** in the atmosphere **is stored in soil organic matter**, a complex of living microbes and decomposing plant and animal tissues.

Pimentel, D., Hepperly, P., Hanson, J., Douuds, D., Seidel, R. (2005). Environmental, Energetic and Economic Comparisons of Organic and Conventional Farming Systems. *Bioscience* (55) 7: 573-583.

- The Rodale Farming Systems Trial, which is the longest running organic comparison study in the United States documented that after 22 years, **soil organic carbon increased by 15-28 percent in organically managed soils** compared to 9 percent in conventionally managed soils.

Wolf, K., I. Herrera, T.P. Tomich, and K. Scow. 2017. Long-term agricultural experiments inform the development of climate-smart agricultural practices. *California Agriculture* 71:120-124.

- At UC Davis' Long-Term Research on Agricultural Systems study, researchers found that after 10 years, organic systems resulted in **14 times the rate of carbon sequestration** as the conventional system.
- After 20 years, organically managed soils sequestered significantly more soil organic carbon than conventionally managed soils.

Ghabbour, E. A., Davies, G., Misiewicz, T., Alami, R. A., Askounis, E.M., Cuzzo, N.P., ... Shade, J. (2017). Chapter One - National Comparison of the Total and Sequestered Organic Matter Contents of Conventional and Organic Farm Soil. *Advances in Agronomy* 146, 1-35.

- An extensive 2017 study comparing soils from 659 certified organic farms and 728 conventional farms found that organic farms across the United States **consistently sequester more carbon** than conventional farms.



Gattinger, A., Muller, A., Haeni, M., Skinner, C., Fließbach, A., Buchmann, N... Niggli, U. (2012). Enhanced top soil carbon stocks under organic farming. *Proc. Natl. Acad. Sci. U.S.A.* 109, 18226–18231.

- Globally, evidence shows that organically managed soils hold significantly higher carbon and **have higher rates of carbon sequestration** than soil from non-organic systems.

Machmuller, M.B., Kramer, M.G., Cycle, T.K., Hill, N., Hancock, D., Thompson, A. (2015) Emerging land use practices rapidly increase soil organic matter. *Nature Communications*, 6, 6995.

- **Grazing sequesters carbon in soil**, particularly under management-intensive grazing systems, which allow ruminants to graze for precise amounts of time in small, rotating pastures.

# Policy Recommendation

- Expand CDFA's Healthy Soils Program to include organic transition package
  - HSP provides financial incentives to farmers and ranchers for healthy soils practices
  - HSP could be expanded to include payments for the development and implementation of an organic system plan in conjunction with implementing healthy soils practices

<https://www.cdfa.ca.gov/oefi/healthysouils/>



Questions?