



## Cornerstone Practices for Water Resource Stewardship: Creating drought-resistant soils

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## UN Resolution

Recognizing the economic and social significance of good land management, including soil, particularly its contribution to economic growth, biodiversity, sustainable agriculture and food security, eradicating poverty, women's empowerment, addressing climate change and **improving water availability, and stressing that desertification, land degradation and drought are challenges of a global dimension** and that they continue to pose serious challenges to the sustainable development of all countries, in particular developing countries

[http://www.fao.org/fileadmin/user\\_upload/GSP/docs/iys/World\\_Soil\\_Day\\_and\\_International\\_Year\\_of\\_Soils\\_UNGA\\_Resolution\\_Dec\\_2013.pdf](http://www.fao.org/fileadmin/user_upload/GSP/docs/iys/World_Soil_Day_and_International_Year_of_Soils_UNGA_Resolution_Dec_2013.pdf)

## From Gov. Brown Budget

Healthy Soils – As the leading agricultural state in the nation, it is important for California's soils to be sustainable and resilient to climate change. Increased carbon in soils is responsible for numerous benefits **including increased water holding capacity**, increased crop yields and decreased sediment erosion. In the upcoming year, the Administration will work on several new initiatives to increase carbon in soil and establish long term goals for carbon levels in all California's agricultural soils. CDFA will coordinate this initiative under its existing authority provided by the Environmental Farming Act.

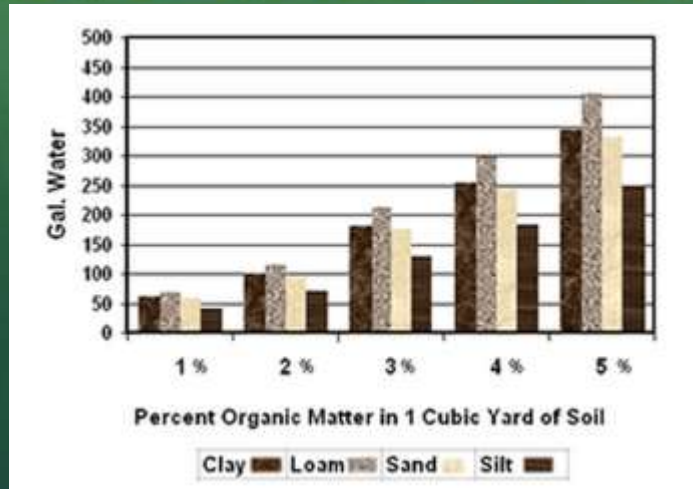
## Quantifying Water Conservation



- 4 inch layer of mulch can save 130,000 gallons of water/acre in vineyards
- Water holding capacity increased by 40%\*
- 49% greater water holding capacity in a soil with sod amended with 25% compost
- Marin Carbon Project 1/2 inch compost one time 2600 gallons/acre

\*University of New South Wales, Australia

# Water Holding Capacity



From: <http://www.denverwater.org>

## Soil Structure

Can't change texture.  
What does soil structure do?

Affects water infiltration rate and water holding capacity, enhances root penetration, optimizes soil aeration, stimulates microbial diversity



## Compost

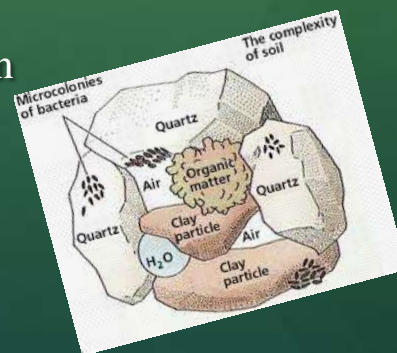
- In the Soil/**On Top**
- Supplies Nutrients
- Directly Improves Soil Structure
- Conserves Water
- Improves CEC
- Some Erosion Control

## Mulch

- On Top of the Soil
- Zero Nutrient Input
- Slow Soil Structure Improvement
- Conserves Water
- No CEC Change
- Reduced Erosion

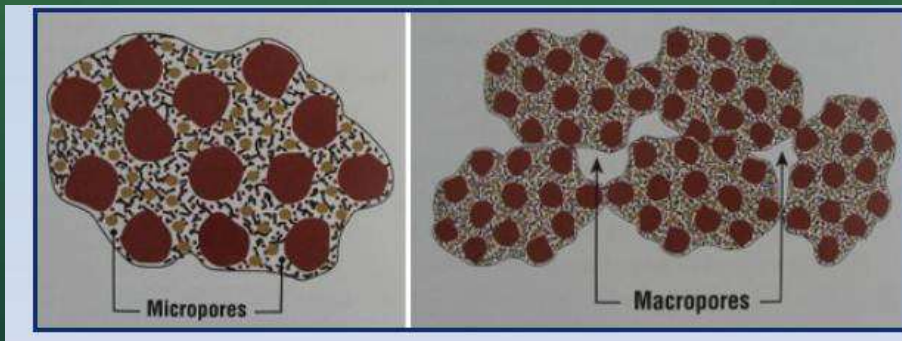
## Soil Aggregation

- Tilt, Friability, Soil Structure
- Aggregation Formation
- Aggregation Destruction
- Soil Aeration
- Root Penetration



## Soil Moisture Management

- Increased Water Holding Capacity (Sandy)
- Increased Water Permeability (Clay)



## Feed the Soil Not the Dump

- 50-70K tons of food scraps landfilled per year
- Almost 100,000 TPY (300 TPD) of yard debris and wood turned into compost and mulches
- Over 1,600,000 tons converted into compost and mulch



# Environmental Impacts

<http://www.nrdc.org/food/files/wasted-food-IP.pdf>

Wasted: How America Is Losing Up To 40%  
Of Its Food From Farm To Fork To Landfill



25% of our agricultural water is used for food that is  
never consumed

	LOW NITROGEN REQUIRING PLANTS	HIGH NITROGEN REQUIRING PLANTS
WELL DRAINED	SONOMA COMPOST	ORGANIC HI-TEST COMPOST
POORLY DRAINED	TERRA LITE	MALLARD PLUS

# Mulches

- Aesthetics
- pH
- Coarse to last, resist blowing away
- High C for weed suppression, aggregation
- Water conservation
- Temperature moderation
- Slowly build soil
- Lazy soil preparation (fall)

Thank you  
Questions?



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